FAA Aviation News

SAFETY FIRST FOR GENERAL AVIATION

May/June 2008
Volume 47/Number 3

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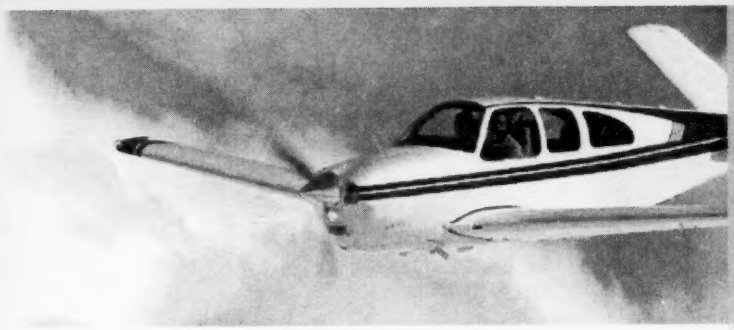

About the Cover: *This 1962 Beech P35 shows the beauty of flying a general aviation aircraft above the clouds. (Please note the registration number was removed by* FAA Aviation News*) Photo provided by Adrian A. Eichhorn.*

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Jumpseat

"Be Careful Out There"

Last year, general aviation (GA) had the fewest fatal accidents and fewest fatalities since World War II. There were 284 fatal GA accidents in 2007, nearly half the number of fatal accidents reported 20 years ago. There are several reasons trends are heading in the right direction. For one, technology is making a difference. Today's GA aircraft are better designed, as well as better built, with more reliable engines and—this is important—they provide greater and enhanced information in the cockpit.

Two, we are seeing more evidence of a safety culture across the GA spectrum. Pilots understand the importance of continuing education and take advantage of additional training opportunities. Furthermore, many manufacturers of high-performance aircraft offer—some even require—training before you can fly that nifty piece of equipment back home.

Three, pilots are more serious about flying, whether as profession or pastime, and understand that it demands respect. More pilots are making it a habit to assess risk, understand their personal minimums, and practice risk management. Airmen understand these practices are not just for airlines and corporate flight departments. Knowing risks and understanding consequences are becoming more widely accepted as part of basic preflight procedures, whether you are flying a Piper *Warrior* or a Cessna *Mustang*.

At the same time, let me highlight what FAA is doing to help the GA safety record continue to improve. Several years ago, we formed the General Aviation Joint Steering Committee (GA JSC) to work together with a range of organizations, including the Aircraft Owners and Pilots Association/Air Safety Foundation (AOPA/ASF), Experimental Aircraft Association (EAA), General Aviation Manufacturers Association (GAMA), Helicopter Association International (HAI), National Air Transportation Association (NATA), National Business Aviation Association (NBAA), National Transportation Safety Board (NTSB), National Weather Service (NWS), and Small Aircraft Manufacturers Association (SAMA).

Subgroups under the JSC umbrella develop specific safety interventions. For example, we formed the turbine aircraft operator subgroup, co-chaired by FAA's Peter Devaris and Net Jets' Dave Hewitt, because turbine aircraft operations in the corporate, fractional, and on-demand charter sectors of aviation represent a vastly different operating environment from most personal flying. This group developed strategies to improve ground deicing practices for turbine aircraft, developed runway overrun mitigation techniques, among other measures.

FAA Aviation News co-editor Susan Parson co-chairs the personal flying subgroup with AOPA/ASF's JJ Greenway. This group helped develop FAA guidance on conducting flight reviews and instrument proficiency checks. It also contributed substantially to the new *FAA Instrument Flying Handbook*, as well as to ongoing revisions of the *Aviation Instructor's Handbook*, the *Pilot's Handbook of Aeronautical Knowledge*, and the *Airplane Flying Handbook*.

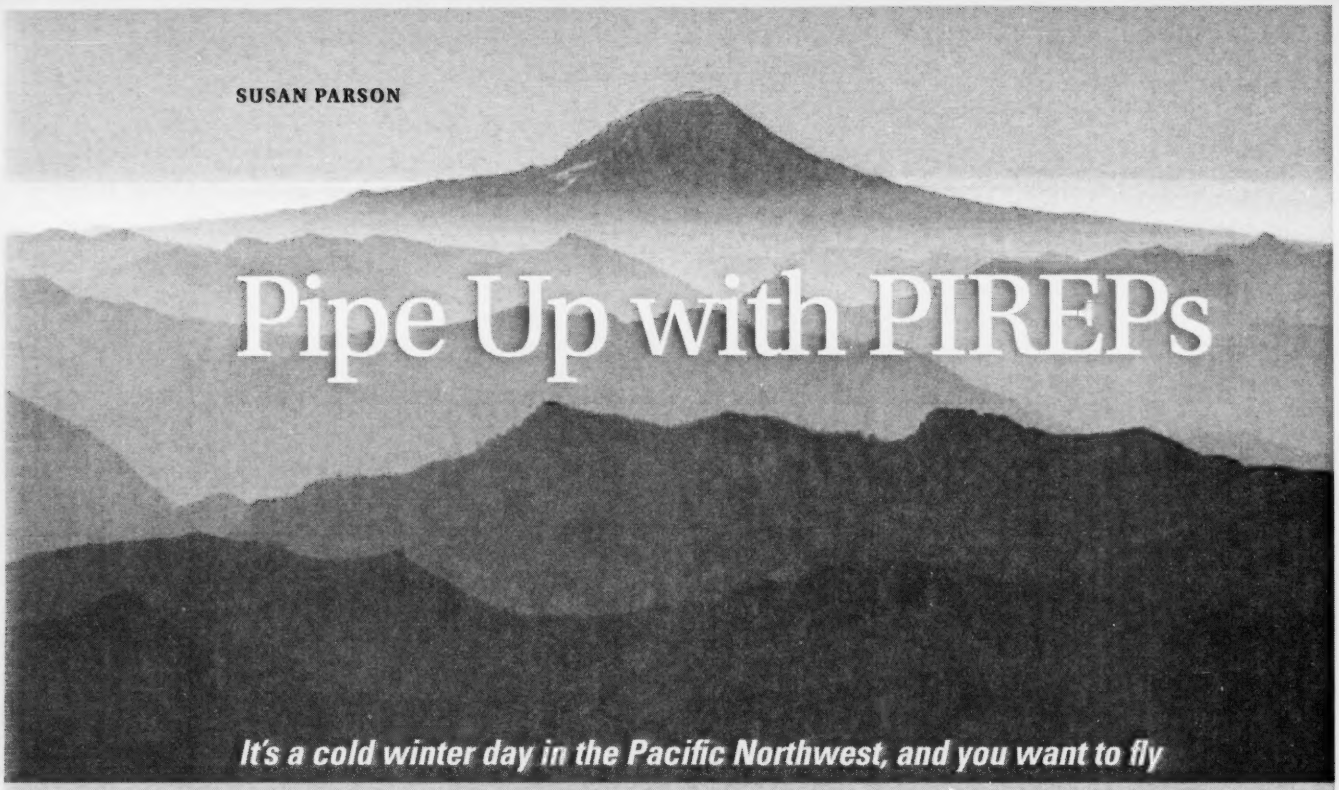
We are seeing more evidence of a safety culture across the GA spectrum.

The JSC recently created an amateur-built aircraft subgroup co-chaired by FAA's John Duncan and EAA's Earl Lawrence. The group will specifically consider factors behind the accident rate for amateur-built aircraft and develop mitigation strategies.

The FAA Safety Team (FAASTeam) hosts seminars, which qualify for credit under the FAASTeam's new online WINGS Pilot Proficiency Program. You can sign up at www.faasafety.gov to create your WINGS profile and receive information about safety events in your area. Also, check out the Learning Center on the www.faasafety.gov Web site. Futhermore, each issue of *FAA Aviation News* will offer resources to improve your airmanship abilities. Also, take advantage of the resources available through aviation organizations, such as AOPA/ASF, EAA, and the new National Air Transportation Foundation (NATF), created to assist aviation businesses train their employees.

The most important element in the safety equation is you. To quote Sarge from that long-ago Hill Street Blues TV show, "Be careful out there."

SUSAN PARSON



Pipe Up with PIREPs

It's a cold winter day in the Pacific Northwest, and you want to fly your single engine airplane from Boeing Field (KBFI) in Seattle to Bowers Field (KELN) in Ellensburg, Washington. You plan to fly Instrument Flight Rules (IFR), but there's an overcast layer and you have to fly over the Cascades. You know that the freezing level is close to the 8,000 feet Mean Sea Level (MSL) minimum en route altitude (MEA) along the airway, Victor 2-298. So you know there is certainly potential for icing along your route, but you don't know whether that potential translates to a problem, until you see the following pilot report (PIREP):

SMP UA /OV SEA090040 /TM 1824 /FL075 /TP C182 /WX FV99SM /TA 00 /TB NEG /IC NEG /RM EBND

As you see from reading the PIREP (or its translation in the box below), a pilot flying an aircraft similar to yours, on the route you intend to fly and near your planned altitude, has given you an "all clear" by simply letting Air Traffic Control know that the aircraft has not encountered icing or turbulence along this route. Although you obviously have to evaluate the PIREP in the context of your entire weather briefing, this first-hand report from a fellow aviator may be the single most informative piece of data you have in that stack of "all available information" you got during your preflight planning process.

This report is a great example of how critical, and how valuable, a so-called "negative PIREP" can be. All too often, pilots—even those in the habit of offering PIREPs—tend to think they are valuable only when the weather is bad. Nothing could be further from the truth. Obviously, it is important to give a "here be dragons" warning when you encounter weather that your fellow pilots should avoid. Since we all love to fly, though, it is the duty of every good aviation citizen to be just as diligent in letting other pilots know when, and where, the air is clear of ice, turbulence, convective activity, and the many other weather dragons that can wreak havoc with your flight.

SMP	Originating facility - Stampede Pass, Washington
UA	Type or report - Pilot Report
OV SEA090040	Location - Seattle VORTAC 090 radial at 40 nm
TM 1824	Time - 1824 Zulu
FL075	Altitude - 7,500 MSL
TP C182	Aircraft type - Cessna 182
WX FV99SM	Flight visibility - 99 SM
TA 00	Temperature - 00
TB NEG	Turbulence - No turbulence
IC NEG	Icing - No icing
RM EBND	Remarks - Eastbound

http://www.ofcm.gov/fmh12/pdf/fmh12.pdf

The negative icing/negative turbulence report from Stampede Pass is a also great example of success in Project PIREP, a 90-day demonstration project that the FAA, the Aircraft Owners and Pilots Association (AOPA)/Air Safety Foundation (ASF), and the National Weather Service (NWS) launched early this year in an effort to generate more real-time pilot reports in the ice-prone skies of the Pacific Northwest.

Here's how it worked in 2008 from January through April. During certain conditions or triggering events—such as known or forecast low ceilings, restrictions to visibility, mountain obscuration, and potential icing conditions—the NWS's Aviation Weather Center (AWC) initiated the targeted PIREP request by having air traffic controllers in the Seattle Air Route Traffic Control Center (ARTCC) and surrounding TRACONs (Terminal Radar Approach Control), e.g., Portland, Spokane, Whidbey Island, and Chinook), specifically solicit at least three PIREPs every hour in multiple sectors.

The goals of the demonstration project were to:

- Increase the quantity and quality of real-time weather reports from pilots.
- Focus the information collection process on the types of conditions and operations that lead to the largest segment of general aviation fatal accidents.
- Make this information available to:

1) Help the AWC more accurately identify areas conducive to airframe icing as well as areas of ice-free alternative routing;

2) Reduce the use of "VFR not recommended" advisories to pilots; and

3) Assist pilots in avoiding adverse weather conditions, including instrument meteorological conditions (IMC), icing, and convective activity.

If you're curious about the results of Project PIREP, stay tuned! The organizations involved in this demonstration effort will review, summarize, and analyze the results in order to enhance the quantity, and quality, of PIREPs on a nationwide basis.

Yet, there's no need to wait for Project PIREP in your area before you participate. Make it a point to help populate the system for your fellow pilots. Pipe up with PIREPs—including "negative" reports—on your next flight, and try to offer at least one PIREP on every flight you make.

How to Give PIREPs

If you're not sure how to give a PIREP, or if the format you read in your weather briefing material seems too

intimidating, here's a table you can reproduce, attach to your kneeboard, and complete during your flight.

For detailed information on reporting weather conditions and providing effective PIREPs, check-out the AOPA/Air Safety Foundation's free online "Skyspotter" course at https://www.aopa.org/asf/osc/loginform.cfm?course=skyspotter&project_code=&/

Susan Parson is a special assistant in the FAA's General Aviation and Commercial Division. She holds an ATP certificate with an airplane multiengine land rating and commercial privileges for airplane single-engine land. She also holds advanced and instrument ground instructor certificates and a flight instructor certificate with ratings for airplane single and multiengine land and instrument airplane.

Information/Conditions *(to be completed by pilot)*	**PIREP Code**
Location *(direction and distance from NAVAID, airport, or waypoint)*	**OV**
Time *(Zulu)*	**TM**
Altitude *(MSL)*	**FL**
Type Aircraft	**TP**
Sky Cover *(bases, tops, layers)*	**SK**
Flight Visibility and Weather	**WX**
Temperature *(Celsius)*	**TA**
Wind Velocity	**WV**
Turbulence *(light, moderate, severe)*	**TB**
Icing *(type: clear, rime, mixed) (rate: trace, light, moderate, severe)*	**IC**
Remarks	**RM**

JAMES WILLIAMS

The Cheapest Insurance, Part 2

Adding an Instrument Rating

An instrument rating will improve your skills.

Susan Parson photo

In the March/April 2008 issue (available online at www.faa.gov/news/aviation_news/2008/media/MarApr2008.pdf), we described accident data that demonstrated when non-instrument-rated pilots fly in poor weather (specifically poor visibility or low ceilings), it rarely worked out well for the pilots. More than 85 percent of these accidents proved fatal. Part 1 of this series recommended an instrument rating as an excellent way to improve your odds of survival. Let's examine this idea.

In general, an instrument rating will improve your skills in aircraft handling, situational awareness, and upset recovery, while reducing the risk of spatial disorientation. This is important, because Loss-of-Control (LOC) and Controlled-Flight-into-Terrain (CFIT) accidents are often caused by spatial disorientation and loss of situational awareness. An instrument rating helps sharpen the skills that count most.

You have a number of options to get an instrument rating. The most obvious one is to go to your local flight school and sign up for a course. But there are some important factors to consider. First, what kind of flight school should you use? For some pilots there isn't much choice. If you live in an area where there is only one flight school within a reasonable distance, then the decision is made for you. If you do have a choice, then you need to decide if you want to go to a Title 14 Code of Federal Regulations (14 CFR) part 61 or part 141 pilot school. There are differences.

While almost all flight schools and instructors will use a syllabus, the part 141 pilot school's syllabi are reviewed directly by the FAA. Also, part 141 pilot schools may require fewer hours to complete a rating or certificate. Of course, many part 61 pilot schools use syllabi that are approved by the FAA in other applications. The main advantage of a part 61 school is flexibility. You can complete the lessons and training items as you or your instructor feel like doing them and are not

An instrument rating is an excellent way to improve your odds of survival.

tied to an order dictated in a part 141 syllabus. So the decision comes down to whether flexibility or reduced flight hours are more important to you.

In addition to improving your flying skills, an instrument rating allows you to avoid problems with airspace. In the IFR (Instrument Flight Rules) world, you don't have to worry about getting into Class B or C airspace. You are also in constant contact with Air Traffic Control, which is helpful in avoiding problems with Special Use Airspace (SUA), such as Temporary Flight Restrictions (TFR) or Air Defense Identification Zones (ADIZ).

The question is whether you want to do your training in a glass cockpit or a conventional aircraft.

Another decision to make is the type of aircraft to use for training. When I pursued my instrument rating, a fully-equipped aircraft meant having dual VOR/LOC (very high frequency omnidirectional range/localizer), an NDB (nondirectional radio beacon), and DME (distance measuring equipment). My training wasn't that long ago, but my version of a "well-equipped aircraft" is a dinosaur in terms of today's technology. GPS (global positioning system) has become widespread in general aviation.

Today, your choices are much more varied. The technology boom has brought integrated glass cockpits to general aviation. The question is whether you want to do your training in a glass cockpit or a conventional aircraft. If you own a glass cockpit airplane or have regular access to one, then doing your instrument training in such an aircraft allows you to get experience in the type of aircraft you are most likely to fly. If you don't expect to fly these aircraft, then doing your training in a conventional aircraft would likely be a wiser choice. An advantage to training in conventional aircraft is, if you do transition to glass cockpit, that you have more experience with the conventional instruments used to back up glass cockpit displays in an emergency.

Spring and summer are great times for flight training, so now is the time to begin if you've been thinking about in instrument rating. It could be worth your life.

James Williams is a Technical Writer-Editor in Flight Standards Service's General Aviation and Commercial Division. He is also a pilot and a ground instructor.

Although an instrument rating is important, proficiency training is continuous as shown by these two FAA aviation safety inspectors planning an instrument flight at Embry Riddle Aeronautical University. They were attending an advanced aircraft Garmin 1000™ "glass cockpit" training course.

H. Dean Chamberlain photo

Checklist

SUSAN PARSON

"License" to Learn?

One of the most common sayings in aviation is that your pilot certificate is a license to learn, and your non-flying friends and family members will always think of that precious bit of plastic (or piece of paper) as your "pilot's license." You might have noticed, though, that the term "license" doesn't appear in the regulations, advisory circulars, or other official documents. Instead, the FAA calls it a pilot "certificate."

Does it matter? You can certainly argue, as Shakespeare did in Romeo and Juliet, that "a rose by any other name would smell as sweet," and that your privileges as a pilot would be the same regardless of the term you apply to the document. That's true enough. In aviation, though, precise (and correct) terminology is important. The FAA publishes an entire *Pilot/Controller Glossary* of terms to ensure that the meaning is identical on both ends of the microphone. It can be found at http://www.faa.gov/regulations_policies/orders_notices/air_traffic_orders/. Also, one of the AOPA Air Safety Foundation's most popular seminars these days—*Say It Right*—emphasizes the importance of correct radio terminology.

No one would suggest that the license-or-certificate question is a safety matter. Still, using, or at least knowing, the correct terms is part of the "right stuff" for being a professionally-minded pilot. So, let's take a closer look at some of the terms and definitions associated with the authorization of pilot privileges.

Pilot Certificates

The basic document that the FAA issues to a pilot is a certificate. Merriam-Webster's online dictionary defines a certificate as "a document certifying that one has fulfilled the requirements of, and may practice in, a field." Since an individual must fulfill certain requirements to practice in the field of aviation, the term fits.

There are several different levels of pilot certification, depending on the extent of training and testing required. The first, of course, is the student pilot certificate, which is usually issued in connection with the individual's first aviation medical certificate. Medical certification isn't necessary for a student glider or balloon pilot. The newest pilot certificate level is the sport pilot certificate, which was added in 2004. Another basic level is the recreational pilot certificate. As the titles suggest, these pilot certificate levels are designed to facilitate flying for sport or recreation. Since they require less training than FAA and International Civil Aviation Organization (ICAO) standards prescribe for a basic pilot certificate, the privileges conferred by the sport and recreational pilot certificates are more limited.

The basic document that the FAA issues to a pilot is a certificate.

For basic pilot privileges that do meet ICAO standards, the FAA issues a private pilot certificate, which has historically been the most common pilot certificate. For those who wish to fly for pay, or "for compensation or hire" as the official documents put it, a higher level of certificate is required. The training and testing standards required for this privilege are understandably more rigorous. The commercial pilot certificate and the airline transport pilot (ATP) certificate certify that the holder has successfully completed those requirements, and is qualified to exercise the more extensive privileges associated with that certificate level.

Instructor Certificates

Although we naturally tend to think of flight instructors as pilots, the certificate issued to a flight instructor is considered to be an instructor certificate, and not a pilot certificate. Possession of a commercial or ATP-level pilot certificate is generally required for issuance of a flight instructor certificate and, naturally enough, the holder of a flight instructor certificate may exercise its privileges only when the instructor certificate is used in combination with the appropriate pilot certificate. In contrast, the holder of a ground instructor certificate is not required to hold a pilot certificate.

Ratings

Except for student and sport pilot certificates, which we will address later, all pilot and instructor

certificates have associated ratings. According to its official definition, a rating is "a statement that, as part of a certificate, sets forth special conditions, privileges, or limitations." In other words, ratings specify what, and/or how, the pilot is qualified to fly, and they come in several varieties. The most common form is the aircraft category and class rating. A typical rating on a private pilot certificate is "airplane single-engine land." If you subsequently decide that you want to fly twin-engine airplanes, you need to complete the training and testing requirements for a multiengine rating. Your private pilot certificate will then have ratings for "airplane single and multiengine land."

Take advantage of the great weather and exercise your license to learn!

There are obviously many possible combinations of certificates and ratings for aircraft category and class. For example, you might have a commercial pilot certificate with an airplane single-engine land rating. If you train and test in a multiengine airplane to the private pilot certificate level rather than the commercial level, you will still have a commercial pilot certificate with an airplane single-engine land rating, but it will note that you have a multiengine land rating with private pilot privileges.

For a pilot to legally act as pilot-in-command of any aircraft that is more than 12,500 pounds maximum gross takeoff weight or of any turbojet, an aircraft-specific type rating (e.g., B737) is required, in addition to the appropriate aircraft category and class rating.

Ratings are also added to a certificate when the pilot qualifies for a certain operating privilege, such as an instrument rating, in a specific aircraft category and class. For instance, let's assume that the pilot has a private pilot certificate. The aircraft category and class rating is airplane single-engine land, and the pilot also has an instrument rating. To add a multiengine land rating, the pilot must complete the required instrument training and testing in the multiengine airplane to have instrument privileges for the new aircraft category and class.

H. Dean Chamberlain photo

Endorsements

An endorsement attests to the completion of ground and/or flight training required for specific operating privileges or for airman certification testing. Except for certain endorsements made in pen and ink on a student pilot certificate, endorsements are generally made in the pilot's logbook. The endorsements required by Title 14 Code of Federal Regulations (14 CFR) part 61 fall into several broad categories:

- **Student Pilots:** Because a student pilot certificate has no aircraft category and class ratings, operating privileges and limitations for solo flight are conveyed exclusively through instructor endorsements. Endorsements in this category are usually limited not just to aircraft category and class, but also to a specific make and model. Student pilot endorsements can also specify weather limitations.
- **Sport Pilots:** Like a student pilot certificate, a sport pilot certificate is issued without aircraft category and class ratings. Logbook endorsements specify the category, class, make, and model of aircraft that the sport pilot is authorized to fly as pilot in command.
- **Testing for Certificate or Rating:** To take a knowledge test or practical test for most pilot certificates and ratings, the applicant must have endorsements attesting to aeronautical knowledge and flight proficiency (including aeronautical experience and practical test preparation required in 14 CFR section 61.31(a)(6)). The flight instructor applicant endorsements for completing the fundamentals of instruction and spin training fall into this category as well.
- **Recurrent Training:** To maintain the operating privileges conferred by a pilot certificate or instrument rating, the pilot must have an endorsement for satisfactory completion of required recurrent training (e.g., flight review or instrument proficiency check).
- **Aircraft Characteristics:** The requirement for a type rating is limited to large (greater than 12,500 lbs maximum gross takeoff weight) and turbojet-powered aircraft. However, certain small and piston-powered aircraft have characteristics that require additional training for safe operation. For example, 14 CFR section 61.69 specifies training and experience required for towing a glider. Specific additional aircraft training requirements are outlined in 14 CFR section 61.31, and instructor endorsements that attest to the satisfactory completion of this training are the mechanism used to confer the necessary operating privilege. Endorsements related to aircraft characteristics include those for complex, high performance, high altitude, tailwheel, and glider ground operations. In addition, 14 CFR section 61.31(h) provides for "additional aircraft type-specific training" in cases where the FAA has determined that such training is required.

Still a License to Learn

No matter the level of certificate or the number of ratings you hold, the beauty (and challenge) of aviation is that there is always some new combination to earn, which means something new and exciting to learn. The spring and summer season is a great time to embark on an aeronautical improvement project, so take advantage of the great weather and exercise your license to learn!

Susan Parson is a special assistant in the FAA's General Aviation and Commercial Division. She holds an ATP certificate with an airplane multiengine land rating, and commercial privileges for airplane single-engine land. She also holds advanced and instrument ground instructor certificates, and a flight instructor certificate with ratings for airplane single and multiengine land and instrument airplane.

Answers to Airport Sign Quiz (page 32)

1-C, The pilot would see this sign when on and lined up with the runway.

2-F, On taxiway—Provides direction to turn at next intersection to maneuver aircraft onto named taxiway. On runway—Provides direction to turn to exit runway onto named taxiway.

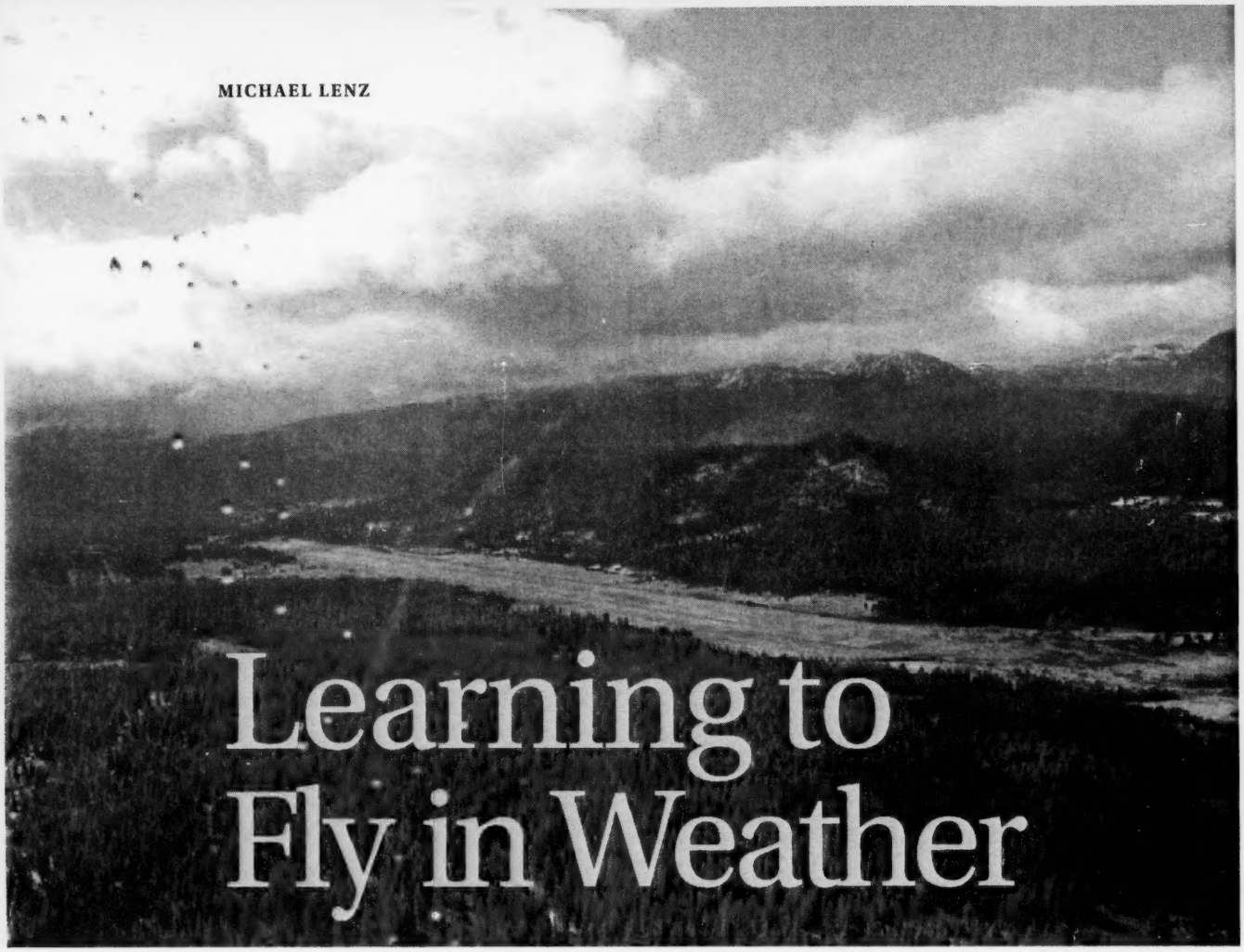
3-A, Towered airport—Hold when instructed by air traffic, clearance required to cross. Nontowered airport—Proceed when no traffic conflict exists.

4-D, Identifies paved areas where aircraft entry is prohibited.

5-B, Pilots exiting this area would use this sign as a guide to judge when the aircraft is clear of the ILS critical area.

6-E, Pilots exiting this area would use this sign as a guide to judge when the aircraft is clear of the protected area.

MICHAEL LENZ



Learning to Fly in Weather

Claudio Bellotto photo

Elsewhere in this issue, we note that an instrument rating—the "cheapest insurance"—can greatly reduce a pilot's risk of losing control of an aircraft in instrument meteorological conditions (IMC). As with any insurance policy, though, its validity depends on whether you pay the premiums on a regular basis. In the case of an instrument rating, paying the premiums on your insurance means not only that the pilot is Instrument Flight Rules (IFR)-rated, but also that he or she is current and proficient, and operating on an IFR flight plan.

According to recent accident statistics, 116 *instrument-rated pilots* lost control of the aircraft in weather, while on an IFR flight. Seventy-seven (77) of these pilots were operating in what should have been benign IMC conditions. In other words, no ice, severe turbulence, or other factors that would have precluded an IFR pilot from maintaining safe aircraft control. In addition, 54 pilots lost control of the aircraft due only to light conditions or darkness, not weather.

If we look at loss of control accidents due to weather on other than IFR flight plans, there have been nearly 220 fatal accidents since 1996. Seventy (70) of these pilots held instrument ratings. The high number of loss-of-control accidents, even when the pilot is IFR-rated, might initially seem surprising. Why would an instrument-rated pilot not be able to maintain control of the aircraft and reverse course while on a flight that is supposed to remain clear of all clouds in the first place?

There are several possible reasons. One is that illusionary effects can occur quickly, when the pilot's senses disagree with indications from the aircraft instruments. When the inexperienced, non-proficient, or non-current pilot is suddenly immersed in a challenging environment, coupled with the daunting

reality that lives are at risk, mistakes can compound quickly. It can be very challenging to fly in the clouds, especially for pilots whose instrument training was primarily (if not entirely) conducted under simulated instrument conditions.

Cloud-flying requires practice, even if you have every modern instrument, and unless you keep calm and collected you will get into trouble after you have been inside a really thick one for a few minutes.

Charles Rumney Samson
***A Flight from Cairo to Cape Town and Back*, 1931.**

The knowledge and practical skills gained through instrument training can certainly contribute to pilot safety, but even if you are IFR-rated, you might not be fully prepared to fly safely. The instrument rating works best with the corollary benefits of proficiency and experience. Proficiency is developed in part through experience, which sometimes comes at a price. As one instrument-rated pilot observed after an encounter with IMC: "I used to wonder what kind of idiot would fly into a wall of cloud and put himself into this situation. Then I found out that it's not a wall of cloud, but a rising undercast—and I found that idiot looking back at me in the mirror!"

An obvious remedy is for the instrument-rated pilot to gain experience in the clouds. Unfortunately, actual IMC experience is not always easy to acquire. It would be nice if we could dial up a day with perfect instrument conditions, just as we can on a flight training device. This hypothetically perfect IMC day would include solid clouds that were free of ice and embedded thunderstorms. The cloud tops would be reachable in a typical single-engine, piston-powered, general aviation aircraft, and there would be clear skies above. The ceiling and visibility under these perfect clouds would allow for a comfortable approach and landing for our experience level. Such perfect conditions are rare in the real world, so an instrument pilot seeking to acquire experience in actual instrument weather needs to find a safe way to do so.

Flying with a Mentor

The most obvious way is to fly in actual instrument conditions with an instructor or a proficient instrument pilot, who can serve as a mentor. Mentoring is a process in which an individual with more experience or expertise provides encouragement, advice, and support to a less-experienced colleague, with the goal of helping the person being mentored learn something that he or she would have learned more slowly, less effectively, or not at all, if left alone.

According to *Best Practices for Mentoring in Aviation Education*, a document developed by the FAA and aviation industry members of the General Aviation Joint Steering Committee, a mentor pilot working with a newly-rated or inexperienced instrument pilot can be of particular assistance in two key areas: Building the pilot's weather understanding and helping the pilot *apply* that knowledge to specific flights.

Personal Minimums: One of the most important things that a mentor pilot can do is to help the less-experienced instrument pilot develop individual personal minimums, which can be presented as the human factors equivalent of reserve fuel. Just as reserve fuel is intended to provide a safety buffer between *fuel required* and *fuel available*, personal minimums should be set to provide a safety buffer between the *skills/performance required* for the specific flight, and the *skills/performance available* through training, experience, currency, proficiency, and equipment.

Flight Planning: For at least the first trip in IMC, a mentor can help the less-experienced instrument pilot consider each of the following items:

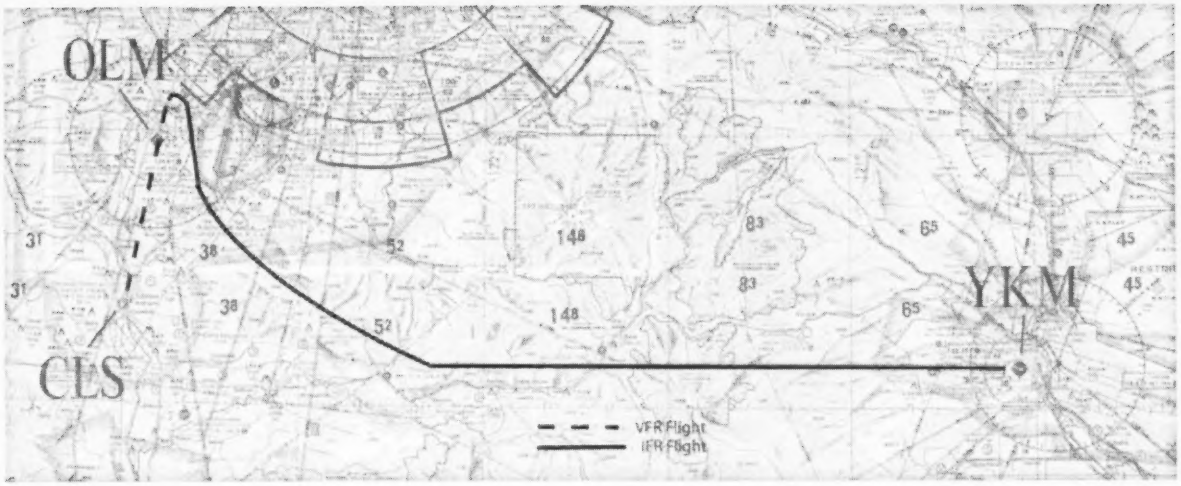
Escape options: Is there good weather within the aircraft's range and endurance capability? Where is it? How long will it take to get there?

Reserve fuel: Legal reserves are a place to start, but more fuel means access to more alternatives.

Terrain avoidance: How low can you go without encountering terrain and/or obstacles?

Passenger plan: Are there alternative arrangements for passengers, if weather conditions require cancellation or diversion to an alternate?

Also, the mentor pilot can help a new instrument pilot focus on key points. One approach to practical weather analysis is to review weather data in terms of how current and forecast conditions will affect visibility, turbulence, and aircraft performance for the mentored pilot's specific flight. Since weather patterns vary widely, a mentor pilot with instrument



Loss of Situational Awareness

Some of the most unfortunate and preventable IFR accidents occur to instrument pilots who cancel an IFR flight plan too soon. The pilot might be tempted to proceed direct to the destination and save the extra time that an IFR arrival might involve. The problem comes when the pilot fails to consider terrain and obstructions during descent. Here's a case in which the pilot was lucky and lived to file an Aviation Safety Reporting System (ASRS) report about his experience.

I was on an IFR flight plan from YKM (Yakima, Washington) to CLS (Chehalis, Washington). CLS does not have an instrument approach available. Reported weather 18 miles to the north of my destination was 1 3/4 to 3 miles visibility and 1,900 foot overcast. About 40 miles out from CLS, I requested the VOR DME 35 approach at OLM (Olympia, Washington) in the event I did not break out for the visual to CLS. The controller asked me if I wanted to "over-fly" CLS or start the approach now. I was not sure what he meant by "over-fly." I did not think it would do any good to fly over CLS at 3,500 feet (the lowest the controller could get me down to) with an overcast reported at 1,900 feet at OLM. I therefore asked to start the approach to OLM, assuming the VOR DME 35 approach, which had been the procedure numerous times before.

The controller cleared me direct OLM and to expect the ILS (Instrument Landing System) approach. I knew from my preflight briefing that the ILS was out at OLM, so I asked the controller if it was available. He came back and confirmed that it was not and to expect the VOR A approach. The purpose of flying the approach is to get lower, break out, and proceed Visual Flight Rules (VFR) to CLS, not to land at OLM. The controller then gave me vectors to set me up east and bring me north of OLM for the final approach course (171 degrees) for the VOR A approach. The controller informed me that an aircraft ahead of me to CLS had broken out and reported bases at 3,300 feet and got in to CLS. My mindset was to stay on the approach until I broke out, cancel IFR, and proceed to CLS. In my mind I saw this happening south of OLM. I broke out at about 4,000 feet. I cancelled IFR and turned southwest to intercept Highway I5 and followed it to CLS. What I failed to recognize was that while on vectors I had flown north and east of OLM.

When I turned southwest and proceeded towards [Highway] I5, I suddenly realized that I was inside of OLM Class D airspace. I called the tower and confessed my situation. The tower advised me the airport was IFR and gave me the weather. I then continued on southwest and left the airspace. My concern is that I entered the Class D airspace without a clearance and failed to ask for a Special VFR to operate in the airspace.

Several factors contributed to this event.

- I failed to make my request clear for the approach I wanted and when I wanted to start it.
- I also became very busy hand-flying the airplane, setting up radios for an unexpected approach, descending, maintaining headings, and trying to maintain situational awareness of where CLS would be when I broke out.
- Even though I broke out at 4,000 feet, ceilings in the area were lower and I was soon down to 1,200 feet with about 3 miles visibility. Most of my attention was directed outside the airplane trying to recognize landmarks and stay VFR.
- I could not see the OLM airport due to visibility until I was already in the Class D airspace. I should have noticed my DME distance, but my attention was outside the airplane.
- It was not until too late that I realized I should have requested Special VFR clearance to operate in the Class D airspace. I also did not believe I had flown north of the OLM airport, while still on vectors and believed myself to be south of OLM. I had obviously lost situational awareness.

I have made this flight numerous times before and was always allowed to descend towards CLS and given the VOR DME 35 approach. If I had not broken out by 3,500 feet, [I would proceed to CLS] by simply turning north and intercepting the inbound final approach course without having to over-fly the airport first. I was not entirely familiar with that terminology. Next time:

- I will maintain better situational awareness.
- I will make my intentions and requests clear to the controller.
- I will ask for Special VFR when approaching Class D airspace.
- I will not give up my IFR clearance until I am positive of my position.

flying experience in a particular region can provide invaluable advice on regional and/or seasonal weather patterns.

Applying Weather Information. One of the most valuable services that a newly-rated or inexperienced instrument pilot can get from an IFR mentor pilot is advice and support while he or she logs the first 10-15 hours in IMC. Although the new instrument pilot will probably be eager to put the rating to use for specific "real-world" reasons (e.g., take the family on vacation or fly colleagues on a business trip), the mentor should encourage the pilot to first complete a jointly developed "post graduate" program. Ideally, the personalized ramp-up syllabus should address and accommodate regional and seasonal characteristics of the pilot's likely operating area. The mentor pilot might help the new instrument pilot look for weather conditions that meet goals on the IFR "post-graduate syllabus."

Flying "with" Captain Buck

The guide on *Best Practices for Mentoring in Aviation Education* includes a sample IFR ramp-up syllabus as well as other worksheets for flight planning and personal minimums. You might also find it useful to consider the advice of Captain Robert Buck, whose book *Weather Flying* [The McGraw-Hill Companies, 1998; the following quotes reproduced with permission of the McGraw-Hill Companies], includes an excellent syllabus for a new instrument pilot to follow. Experienced pilots seeking to maintain proficiency can benefit as well. Captain Buck's advice includes the following points:

Always File an IFR Flight Plan, Even in VMC (Visual Meteorological Conditions) Weather.
When the procedures and communications required to be on an IFR flight plan become routine, even automatic, the instrument pilot has more time to think about weather.

Always Fly the Airplane First.
As Captain Buck puts it, "When a pilot gets into trouble, the first thing needed is to get the airplane under control and keep it under control; then handle the weather."

Take a Step-by-Step Approach.

Good to Good: Begin with flying from good weather to good weather on top of an overcast.

Bad to Good: Once an instrument pilot gains experience and confidence with flying from good weather to good weather on top, the next step is to fly from bad weather to good weather. Departing after passage of a cold front is likely to offer adverse weather at the departure airport, with improving weather as the trip progresses.

Good to Bad: With more experience the pilot is ready to take the next step of flying from good to "bad" (i.e., instrument conditions) at the destination point.

Bad En Route: A trip involving bad weather en route is another way to expand the boundaries of your instrument flying experience.

Remember that Weather Changes Constantly.
Weather is constantly getting better, or getting worse—it never stays the same. Pilots must always pay attention to these changes and note the trend.

Recognize that Experience Takes Time.
As Captain Buck observes, weather flying "cannot be gotten by reading a book, and it cannot be gotten quickly...an instrument rating is a beginning, not an endorsement that one can fly off in any weather."

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Resources

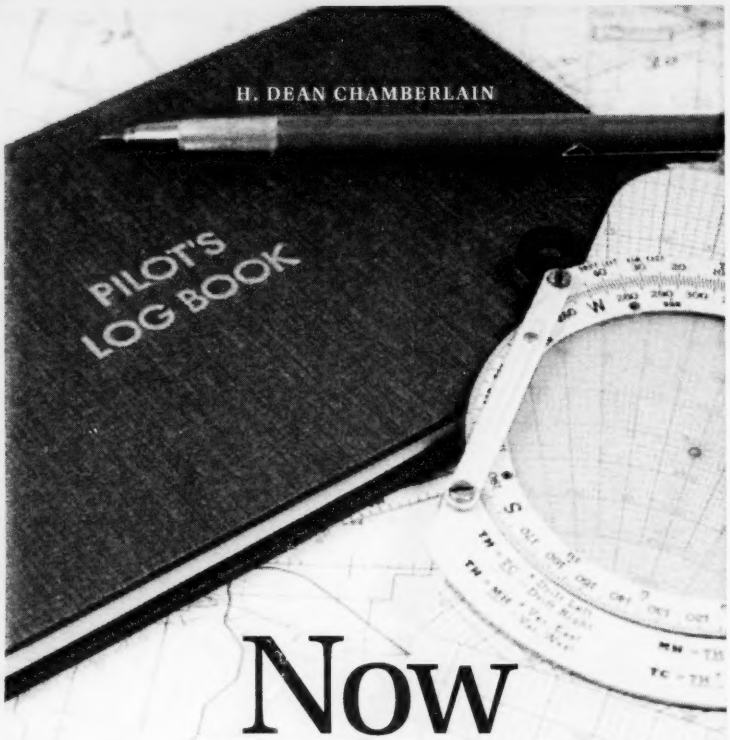
Best Practices for Mentoring in Aviation Education, http://www.faa.gov/education_research/training/media/mentoring_best_practices.pdf

General Aviation Pilot's Guide to Preflight Planning, Weather Self-Briefings, and Weather Decision Making, http://www.faa.gov/pilots/safety/media/ga_weather_decision_making.pdf

Single Pilot IFR (AOPA Air Safety Foundation online course)http://www.aopa.org/asf/online_courses/single_pilot_ifr/

Weather Flying by Robert Buck, The McGraw-Hill Companies, 1998.

Weather Wise Ceiling and Visibility (AOPA Air Safety Foundation online course). http://flash.aopa.org/asf/wxwise_ceilingvis/



H. DEAN CHAMBERLAIN

Now Why Didn't I Think of That?

How do you flight plan? Or, do you flight plan? I thought I had heard of most ways to accomplish this task, but in listening to a recent discussion here at FAA Headquarters, I learned a few things I want to pass on. This particular approach to flight planning does not have to cost you money or a trip to the airport. Here's how it works.

The Big Picture

My instructor on this occasion was a general aviation operations Aviation Safety Inspector, who used to fly corporate aircraft. During this time, he observed that many pilots fail to understand the bigger picture. For example, consider that one of the company's airplanes then cost about $400 per hour in operating costs. In order to maximize aircraft usage on a trip, he routinely flew at maximum cruise speed. Although the conventional wisdom might encourage many pilots to fly at maximum range to conserve fuel, there are two arguments against this practice. First, the purpose of having an aircraft is to get somewhere fast. Flying more slowly at maximum range settings defeats that purpose. Second, the few dollars saved in fuel costs were offset—if not entirely cancelled—by the loss in overall operating costs (e.g., longer flight times and increased hours on the airframe, which resulted in more maintenance expenses).

The lesson: Consider the big picture. If your goal is efficient transportation, your flight planning should consider how best to balance fuel economy and operating costs, and calculate true operating cost rather than simply the fuel cost. If, on the other hand, your mission is to build flight time (e.g., to meet the cross-country flight time requirement for an instrument rating), flying at maximum range settings makes perfect sense. By flying more slowly, a pilot can build the hours on fewer flights with fewer operating cycles, rather than flying quickly and having to make more trips.

Know Your Aircraft

The second, and more fundamental, lesson I took from this discussion was the importance of knowing the aircraft. My "instructor" noted that his practice was to develop multiple flight plans to determine which altitude and power settings would best meet the objectives of that specific flight. Part of this planning was determining the optimum altitude.

For any given airplane, whether a corporate jet or turboprop or a small general aviation airplane, there may be an altitude that will get you to your destination faster after taking into account factors such as winds, distance, and anticipated air traffic routing.

The key is to think in terms of total door-to-door travel time rather than just flight time. This more comprehensive view requires reviewing possible speed restrictions for climb and descent. For example, a slower turboprop aircraft may be able to avoid a long climb to altitude, and later a long descent, by flying lower and slower. But the turboprop may be able to beat a faster jet to the same destination by avoiding the complex high altitude route system a jet may have to operate in. In some cases, simpler air traffic routing or even tower-to-tower flight plans can make up for a lack of speed. Flying on a Visual Flight Rules (VFR) flight plan may be faster than an Instrument Flight Rules (IFR) flight plan when weather permits. Being able to go lower and fly direct may also save you time, by allowing you to avoid having to be merged into a routing that may initially take you out of your way.

Maximizing True Airspeed

In other cases, knowing the optimum speed to fly can reduce your total flight time in the case of headwinds. The secret is knowing how to maximize your true airspeed, which means knowing your numbers. Review your aircraft's flight manual and plot the information for different altitudes on the same sheet of paper. This exercise will let you see the best altitude to fly for your particular flight distance. You might find the results surprising. My "instructor" noted, for instance, that in one of the airplanes he flew, he needed at least an hour in level cruise to justify climbing to a higher cruise altitude.

How much level cruise time do you need in the aircraft you fly to justify a longer climb profile? Do you know the optimum altitude for your aircraft? When he drew a rough graph of true airspeed versus altitude to show the relationship that maximizes a particular altitude for true airspeed, it became clear that too high or too low an altitude would reduce maximum true airspeed. All other things being equal, a higher true airspeed equates into a faster ground speed. In case you were wondering about the impact of using higher power settings, you will need to review the manufacturer's recommendations for your particular airplane. In general, however, higher power settings should not be a problem as long as you remain within the designated limits.

Items to Consider

So where do you start flight planning? To determine the best numbers as described above, you need to ask (and answer) a number of questions. For instance, what are the winds aloft for your flight? Check the weather. Can you file a visual flight plan, or do you need an instrument flight plan? If you are going to file an instrument flight plan, review the route for any special routing that may be available. The FAA *Airport/Facility Directory* (A/FD) contains a listing of preferred IFR routes and can be found at http://www.naco.faa.gov/index.asp?xml=naco/online/d_afd. As stated in the A/FD, "Cooperation by all pilots in filing preferred routes will result in fewer traffic delays and will better provide for efficient departure, en route, and arrival air traffic service."

Although the conventional wisdom might encourage many pilots to fly at maximum range to conserve fuel, there are two arguments against this practice.

Are there any advantages in filing for a specific route? If so, what is the optimum altitude for that route? What is the best airport, if you have a choice, that will minimize any unusual routings? If the weather is bad, what airport offers the best instrument approach based upon your specific type aircraft?

Although it is not emphasized in ground school, flight planning should also address human factors. If you had to divert or delay, what airport offers the best accommodations? In some cases, the airport with the cheaper fuel may be the best choice. In other cases, the deciding factor may be as simple as which airport offers the best $100 hamburger. The choice is yours. It is all about numbers. Make sure you do the math!

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GREGORY FRENCH

"A TAC" of the Charts

You know the drill. Title 14 of the Code of Federal Regulations (14 CFR) section 91.103 tells us that, regarding preflight action, "each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight." Now, if we were to take that literally, we would need a C-5A *Galaxy* to load up on "all available information" for a particular flight. There are, however, certain pieces of information that are implicitly expected to be had by the pilot before each launch. Weather is certainly one. Aircraft limitations and airports to be used are other obvious ones. Another, of course, are aeronautical charts.

And they're current, right? It always amazes me when I hear pilots grouse that they have to spend seven and a half bucks every six months on a new chart, then get into an airplane that they're paying $100 or more an hour for! And, of course, they're appropriate for the area where you're going to fly, right? Well, if you're flying in one of 30 different high-density areas of the country, they might not carry all the available information you need. Those are the areas covered by Terminal Area Charts, or TACs.

A lot of folks are unfamiliar with TACs, because they simply don't fly in high-density areas; therefore, they've never been exposed to them. They're really no mystery. TACs are visual aeronautical charts that use most of the same symbology as the sectionals. The big thing is that they are twice the scale of the more common sectionals. Where the standard sectional scale is 1:500,000, the TAC is at a scale of 1:250,000. The smaller the number on the right of the colon, the larger the scale, the less area covered, and the more detail provided.

We all have current VFR charts folded neatly in our bags, right?

More detail is key. It was recognized as early as the late 1940s that some areas of the country had such a high density of information that the cartographers couldn't stuff it all onto a 1:500,000 scale chart without ending up with just a big ink smear. So they came out with "Local Visual Navigation Charts" for select busy areas, such as Washington, DC; Chicago; Los Angeles; and some others. These charts showed half the area, but twice the detail, and they caught on.

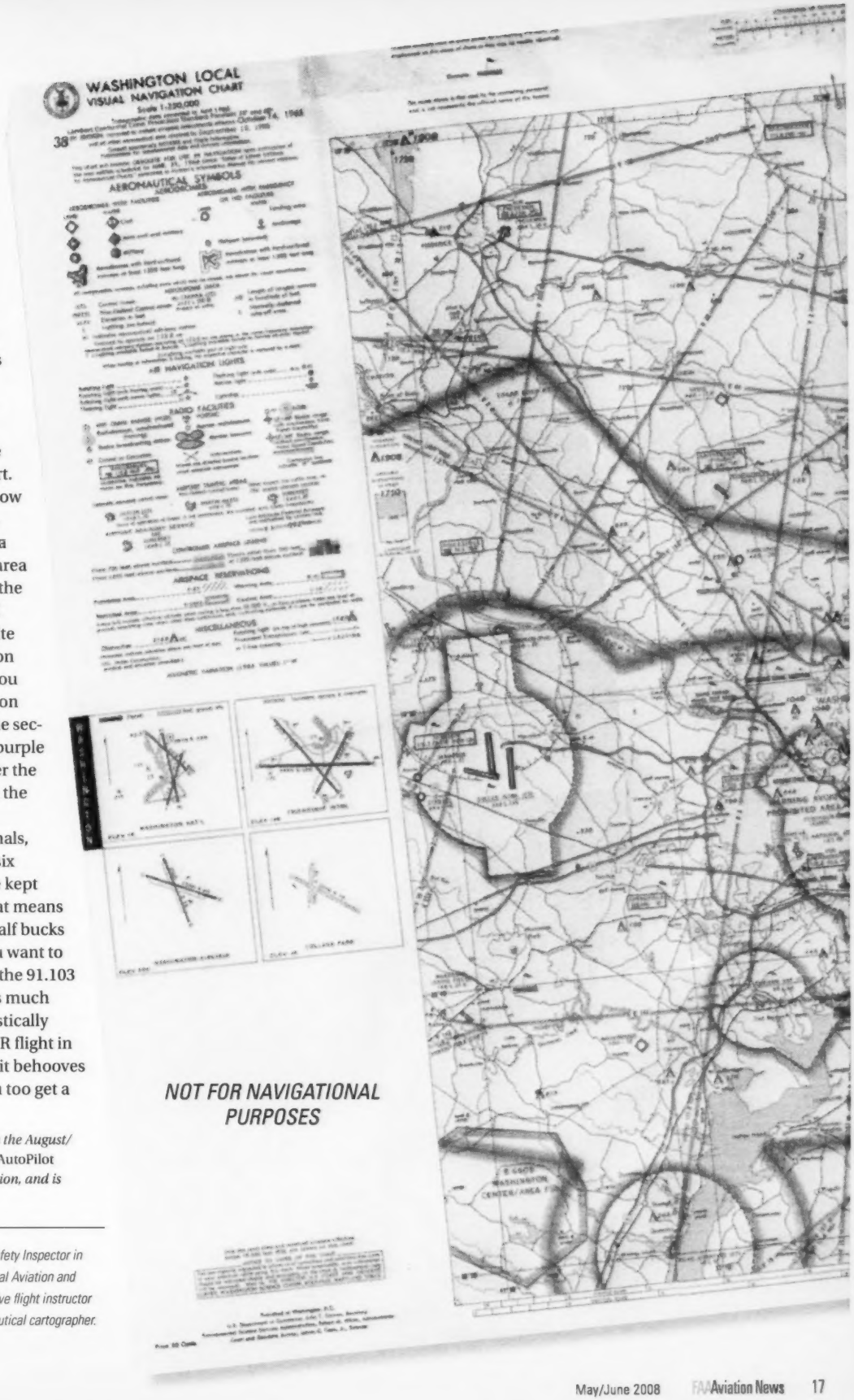
Eventually these evolved into today's Terminal Area Charts. The first was Atlanta, Georgia, which came out on June 25, 1970; followed on August 20, 1970, by Washington, DC, and Chicago. And they've been proliferating ever since. The most recent one is the Tampa/Orlando chart, which came out on September 20, 1990, bringing the total number up to 29. (They actually cover 30 areas, because Anchorage and Fairbanks are both on a single chart.)

How does this relate to 14 CFR section 91.103? The fact is, if you're flying VFR in an area covered by a TAC and you're only using a sectional, you simply don't have enough information about your area. The cartographers at NACO (the National Aeronautical Charting Office) know that diligent pilots are obeying that regulation (and thus using the appropriate TAC) and deliberately leave important pieces of information off the sectional, some more obvious than others.

Let's say you're outside of a busy Class B area like Washington, DC, and you need to enter from, say, the west. What frequency are you going to use to call up approach control? If you're using a sectional, you can figure it out by looking at the sector frequency table at the bottom of the chart, but it's going to take some time. On the other hand, if you're using a TAC, you'll find the appropriate sector frequencies strategically placed all around the boundary of the charted Class B airspace.

How about things you really don't want to bump into? Fewer obstructions are charted on the sectional than on the TACs (but that makes them no less hard if you hit one). More private fields are shown on TACs, and that certainly could prove helpful, if your engine decided to quit. More visual checkpoints are plotted on the TAC. Virtually all VFR GPS waypoints for things, such as Class B flyways, are printed only on the TAC.

While the symbology used on the TACs is essentially identical to that used on the sectionals, there are a few differences. The most prominent is the airport symbol. On the sectional, paved runways up to 8,069 feet are charted in a circle, whereas on



Today's TAC chart evolved from Local Visual Navigation Charts like the 1965 Washington, DC, chart shown here.

the TAC all airports are show as appropriately oriented runways without the circle, enhancing the pilot's sense of positional awareness as he or she approaches that airport.

How do you know if you should be using a TAC? Easy. If there's a TAC published for an area within your sectional, the boundaries of the TAC will be shown by a white band printed directly on the sectional. Also, if you look at the chart location panel on the front of the sectional, you'll see little purple squares printed all over the place. These represent the locations of TACs.

Like the sectionals, TACs come out every six months and should be kept current. And, yeah, that means another seven and a half bucks twice a year. But, if you want to keep with the spirit of the 91.103 regulation and have as much information as is realistically expected of you for VFR flight in congested areas, then it behooves you to be sure that you too get a TAC of the charts.

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SUSAN PARSON

Step by Step:

Teach Emergencies with the ABCs

The mere mention of a flight lesson devoted to emergency approach and landing practice is usually enough to wash the color right out of fledgling pilots' faces and knuckles. I, for one, can understand all too well. In fact, emergency approaches were one of the hardest areas for me to master when I was learning to fly. I struggled to remember what to do first, fumbled around the sky looking for the "best" field, and constantly lost my place on the emergency checklist.

The mere mention of a flight lesson devoted to emergency approach and landing practice is usually enough to wash the color right out of fledgling pilots' faces and knuckles.

In my earliest days as a CFI, I watched both student pilots and flight-review clients suffer though the same kinds of problems. I eventually came across a simple ABC checklist for emergencies, which called for an immediate focus on the most important tasks. Over the years, I have added a few letters and developed the concept into a detailed outline for ground and flight training. It works. Even the most flustered flier can instantly recall the alphabet, and the checklist is structured to stimulate recall of the right tasks in the right sequence.

I start by introducing the emergency alphabet "step letter" outline during a thorough ground briefing. The initial emphasis is on helping the student remember just the letters: Airspeed, Best field, Checklist, Declare emergency, Exit preparation, Fire prevention, and Ground plan. Next, we work through the questions for each letter. Once we have covered these initial concepts, we go out to practice in the airplane. As the student gains practice, experience, and confidence, I begin to require him or her to verbalize the accompanying thought processes.

Airspeed. Students should memorize our best-glide speed and should try not to lose any altitude until reaching that speed. Once there, they trim the aircraft for hands-off glide. The pilot's foremost job is to maintain control of the airplane.

Best field. Students begin by noting wind direction and strength, then noting their present position. Are they directly over a suitable field now? Is there a suitable field at "downwind" position? Is there a suitable field at "base" or "final" position? Students should also note their present altitude relative to traffic pattern altitude, or 800 to 1,000 feet above ground level (AGL). Are they too high or low? How can they fix it—flaps, extend, slips, S-turns?

Checklist. Student should start with a flow pattern across the panel. If altitude and circumstances permit, they should then review the written

Photo Courtesy of Cessna Aircraft Company

Restart Checklist. Under all circumstances, it's more important to fly the airplane than to check the list.

Declare an emergency. Student should note their present position—for example, five miles south of Brunswick, then tune the radio to 121.5 MHz, which should already be in the standby position. When making the "Mayday" call, they should answer "Who" (tail number), "what," "where," and "how many aboard" questions. Lastly, they should set the transponder to 7700.

Exit preparation. They should prepare the passengers for the landing by ensuring seatbelts are tightened, then brief passengers on exit procedures and assignments. Make sure the first aid/survival equipment is in a convenient place, and prepare the aircraft—for example, cracking open doors if the pilot operating handbook/airplane flight manual (POH/AFM) so directs.

Fire prevention. Shut the fuel off, along with the three Ms: mixture, mags, and master. Ensure the fire extinguisher is close at hand.

Ground plan. Pilots should touch down at the slowest possible airspeed, and then evacuate the aircraft. They need to account for everyone and use the first aid/survival equipment as needed.

Teaching appropriate and effective responses and procedures for aviation emergencies is indisputably one of the flight instructor's most important responsibilities. Although this method generally requires more preflight briefing time than a more traditional generic approach, it's well worth the time. I have found that the emergency alphabet "step letter" is a terrific tool in helping students climb toward competence in this most vital of pilot skills.

This article originally appeared in the National Association of Flight Instructors Mentor *and is reprinted with permission.*

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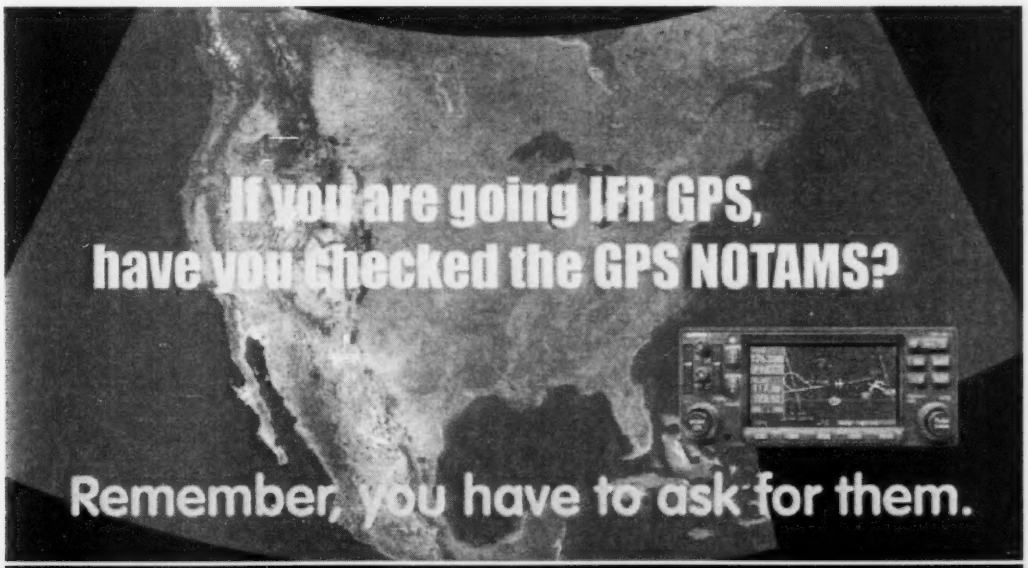
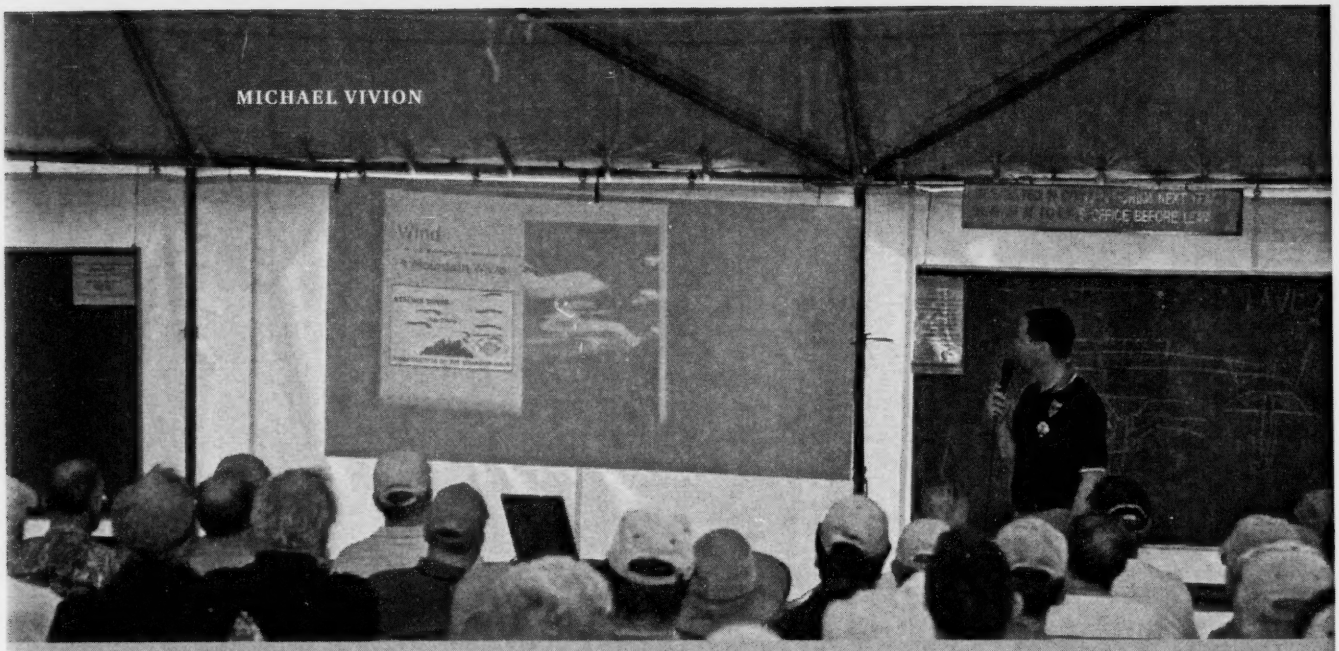


They are also available at https://pilotweb.nas.faa.gov/distribution/center.html by clicking on the "View all GPS NOTAMs" button in the lower right hand corner.



Planning a Flying Workshop

Interested in improving your short field takeoff and landing skills, your knowledge of mountain flying techniques, or maybe some review of instrument procedures? One of the great ways to sharpen your piloting skills, learn some new ones, and enjoy the company of fellow aviators is to participate in a flight training workshop.

The challenge may be finding a workshop in your area, or one that addresses your specific area of interest. If that's the case, consider organizing your own program, and invite other aviators who are also looking for such a training opportunity. Planning such a workshop requires a good deal of time and energy—you can't pull it off by just making a few phone calls. If you're really interested in a particular type of program, though, do the research, develop a plan, and as Nike™ says—"Just Do It!"

The specifics will vary depending on the focus of the program, but here are some thoughts on planning an effective aviation workshop.

Before the Event

Define your topic and objectives. What are you trying to accomplish or learn? While it may seem obvious what you have in mind when you propose a "Mountain Flying" clinic, that title still can cover a lot of ground. You need to have a fairly specific set of goals and objectives that you are trying to accomplish with this program.

Choose the location. An airport may be the obvious choice, but you'll also need space for ground briefings, aircraft parking, fuel, etc. The venue should also be appropriately located for the type of training. For example, Iowa is not the place for a mountain flying clinic. Remember that ground briefings require adequate seating, good acoustics, and (if projection technology is involved) a room that can be darkened.

Select and book your presenters/instructors. It goes without saying that they should be qualified and credible—and that they should be effective speakers. If you need ideas or recommendations, talk to the local flight school, a FAASafety Team (FAASTeam) representative, or the FAASTeam program manager for your area. (The FAASTeam's Web site is www.faasafety.gov/.)

H. Dean Chamberlain photo

Line up the equipment. If presenters are using PowerPoint®, obtain a projector and screen. Have presenters bring content on a disk or flash drive, and use a computer and projector set up in advance. Nothing loses an audience faster than 20 minutes of watching someone try to make the computer talk to the projector.

Consider insurance & liability needs. Will presenters bring an airplane to the event for training? If so, verify that it is insured, and that this use is within the scope of the policy. Don't forget to consider event insurance as well. Pilots offering flight instruction during the event should carry their own liability insurance, which is available through the National Association of Flight Instructors or the Aircraft Owners and Pilots Association.

Most attorneys will tell you that a waiver of liability has little influence in a court of law, but that they aren't a bad idea either. Include procedures to be followed in the liability waiver, since it becomes something of a contract between organizers and participants. You might want to consult an attorney. Verification of aircraft insurance and airworthiness will help to protect your instructors, so ask participants to bring copies of the aircraft's current annual inspection and Airworthiness Directives (AD) compliance record, as well as the usual aircraft documents.

Arrange fuel and maintenance. As noted earlier, verify that adequate aircraft parking and tiedowns are available. Make certain that fuel is available during the hours of the program. Is there a mechanic in the area who can be "on call" for minor maintenance glitches?

Designate training areas to help separate traffic. These areas should be suitable for the type of training and mapped with easily recognized boundaries. Give each participant a map of training areas, as well as a schedule of who will be in each area.

Establish communication procedures. An event radio frequency helps improve situational awareness, but talk on such a frequency should be kept pertinent and to a minimum. Use a frequency, such as 122.75 MHz, for air-to-air communications, and keep the Common Traffic Advisory Frequency (CTAF) free for its intended purpose.

Designate one or more "dispatchers." These individuals should remain at the training site to coordinate schedules for training areas and instructors. Participants may take turns, or it could be a great way for non-flying spouses to participate.

Train your helpers. Be clear about what you expect. Dispatchers should record takeoff times, training area assignments, flight profiles, persons on board, and estimated time of arrival (ETA) for each aircraft. Someone should keep a written description of each aircraft, including registration number, make, model, color, and fuel on board for each flight. Equip dispatchers with a handheld radio, access to a telephone, and a list of emergency numbers (e.g., local law enforcement, Flight Standards District Office duty number, the agency that coordinates search and rescue in the area, local medical facilities, and emergency contact information for each participant).

Susan Parson photo

One of the great ways to sharpen your flying skills is to participate in a flying workshop.

During the Event

Track your participants. Someone—the dispatcher or another responsible person—should always know where participants are and have an ETA for each one. I once participated in a ski clinic where most of the pilots and instructors were commuting to the training site each day. I got stuck one afternoon

and needed several hours to free the airplane. When my instructor and I returned to base, hours past our flight planned ETA, everyone else had gone home for the night. Had we been in an accident, we would have been in real peril, since we were relying on our compatriots to keep track of us. Consider telling participants that search and rescue procedures will be initiated 15 minutes after proposed ETA, then stick to this policy.

Follow the plan. Ensure that the plan is followed to the letter. Make absolutely certain that all participants have a clear understanding of what the procedures will be. Latecomers should get a full safety briefing.

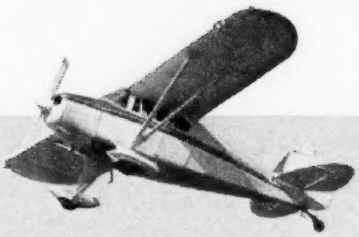
Have fun! The social interaction associated with flying events is always one of the best parts of any flying workshop. Planning a barbecue, pancake breakfast, or evening social will bring participants together when not flying, and many pertinent lessons can be exchanged in these venues as well. Inviting participants to camp at the site helps keep everyone nearby, and enhances the social aspects of the event.

After the Event

Get feedback. Ask participants to provide feedback on the positives and negatives of the program. If you decide to take on the task of organizing such an event again the next year, you'll need that feedback to decide which parts of the program offered the most value, which could be dropped, and what could be added to improve the value to participants.

Good luck and good flying!

Michael Vivion learned to fly in Hawaii in 1969. He subsequently served as a Wildlife Biologist/Pilot for the U.S. Fish & Wildlife Service for nearly 30 years. He now teaches aviation subjects and flight instructs at the University of Minnesota, Crookston. Vivion is a CFII, MEI and holds a National Association of Flight Instructors (NAFI) Master Flight Instructor designation.



Flying Workshop Checklist

Before the Event

- ☐ Define your topic and objectives
- ☐ Choose the location
- ☐ Select and book your presenters/ instructors
- ☐ Line up the equipment
- ☐ Consider insurance and liability needs
- ☐ Arrange fuel and maintenance
- ☐ Designate training areas to help separate traffic
- ☐ Establish communication procedures
- ☐ Designate one or more "dispatchers"
- ☐ Train your helpers

During the Event

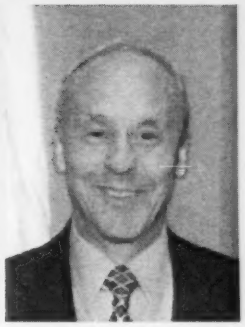
- ☐ Track your participants
- ☐ Follow the plan
- ☐ Have fun

After the Event

- ☐ Get feedback

Aeromedical Advisory

FREDERICK E. TILTON, M.D.
FAA FEDERAL AIR SURGEON



Welcome Aboard MedXPress!

With the nationwide launch of MedXPress last year, aviators all over the country have access to a tool that will shorten the time spent with the Aviation Medical Examiner (AME) and expedite processing of the medical certificate. Here's the story.

What Is MedXPress?

FAA MedXPress is a Web application used for the electronic (Internet) submission of the applicant information portion (items 1-20) of FAA Form 8500-8, Application for Airman Medical Certificate or Airman Medical & Student Pilot Certificate. MedXPress is a key part of the FAA's ongoing effort to make the Aerospace Medical Certification Division (AMCD) paperless, which will allow the FAA to be more efficient and to reduce costs.

How Do I Participate?

All you need to participate in FAA MedXPress is a valid e-mail address, which you will use to create an FAA MedXPress account at https://medxpress.faa.gov/. Use the "Request an Account" button to get started. After you complete the sign-up process, you will receive an e-mail message with your MedXPress username and password.

Once you have an active MedXPress account, you will be able to log in and complete the applicant information (front) portion of the medical examination form (8500-8). If you need help on any specific item, just click on the item number for a link to the instructional sheet normally attached to the hard copy of Form 8500-8. If you enter some of your data, but aren't ready to submit it yet, MedXPress will retain the parts you have already completed for 60 days. When you do finish this portion and click the SUBMIT button, you will receive a confirmation number.

You will probably want to print a copy of your application, which is in PDF format and looks just like the hard copy you are accustomed to completing in the AME's office. Take both the hard copy and the confirmation number to your AME when you go in for your physical exam. Your AME will use the confirmation number to access the information you submitted electronically. The AME will review your responses, complete the physical examination, and submit the results of your exam electronically to the FAA's Aerospace Medical Certification Division (AMCD).

What If I Need to Make Changes?

Once you have electronically submitted your application, you cannot make changes, but your AME can once he or she has retrieved it. The FAA's computer system will require the AME to make a comment and to check "yes" to a box stating that you have agreed to the changes being made.

Is MedXPress Mandatory?

Airman participation in FAA MedXPress is strictly voluntary. You can still choose to complete the hardcopy Form 8500-8.

Does My AME Know about MedXPress?

Your AME has been informed about MedXPress, but participation in MedXPress is currently voluntary for AMEs as well. However, the FAA's Aerospace Medical Certification Division strongly encourages AMEs to participate.

How Do I Know If My AME Uses MedXPress?

When you call for your next examination, ask the receptionist if your AME is a participant in the FAA's MedXPress program. If so, he or she will ask for your confirmation number, and remind you to bring a printed copy of the online application with you to your appointment.

Where Can I Get More Information?

To create an FAA MedXPress account: https://medxpress.faa.gov/. To get basic information on FAA medical certification procedures: http://www.faa.gov/pilots/medical/.

Try it out, and let us know what you think. We will continue to refine and enhance FAA MedXPress, and we look forward to seeing you online.

Good health and safe flying!

During a 26-year career with the U.S. Air Force, Dr. Tilton logged over 4,000 hours as a command pilot and senior flight surgeon flying a wide variety of aircraft. He currently flies the Cessna Citation 560 XL.

SUSAN PARSON

Birds, Bees, and Baleen Whales

Susan Parson photo

Birds have no respect for aircraft. These photographs show what sitting birds can do to an airplane. If the aircraft is not kept clean, bird droppings can damage the paint and potentially damage the underlying structure.

It was a beautiful early spring day. As I walked across the ramp to the borrowed *Aztec* I planned to fly that morning, the skies were blue and the birds were chirping.

The birds were also building nests—in airplanes—and, specifically, in the airplane I intended to fly. I was accustomed to the twittering cacophony of the starlings who nest every year in the apparently (and sadly) abandoned *Aerostar* assigned to a nearby tiedown. But, since we were always careful to leave the *Aztec* with cowl flaps closed and engine/air intake ports plugged with netting, I felt confident that the starlings would understand there was no room in the intake, so to speak, and fly on.

No such luck.

The first clue was a large and pronounced spatter of, um, waste matter under the right engine nacelle. Ugh.

The second clue was finding bits of straw threaded through the netting that was supposed to block off the air intake. Uh-oh.

The confirmation came when I opened the oil filler port atop the right engine nacelle. Instead of the clean (okay, oil-stained) metal I hoped to see, there was nothing but nest—and it was *everywhere*. I was simply astonished, first by the fact that this determined bird had made it through the tightly packed netting even once and even more by realizing how many times the bird had threaded her way through to build a nursery of this magnitude.

Happily for me, Mother Bird wasn't around to witness the destruction of her hard work, or the disappearance of the two small eggs she had deposited atop the right engine crankcase. Happily for everyone else, the *Aztec*'s end-of-ramp tiedown spot spared them from hearing my snarls of frustration during the nearly two-hour clean-up process.

Although the *Aztec* incident was the most annoying encounter I have had with nesting birds, it was by no means the first or only one. One hot July day, for example, a flight review client and I spent more than an hour opening his airplane's inspection panels in order to evacuate a pair of birds who were scoping out the tail section as a possible summer home. Fortunately, we discovered the activity before our feathered friends could clog the control cables with straw or cause corrosion with bird waste.

Birds aren't the only creatures who see your airplane as a real estate bargain. Bees and other small insects can find it attractive as well. Last spring, for instance, I found that a small, but determined, band of yellow jackets had built a honeycomb structure where the aileron attaches to the wing. While the yellow jackets' nest did not pose the same kind of problems created by a bird nest in the engine compartment or fuselage, I narrowly escaped being stung during my preflight inspection. Stings are never fun, but if you or any of your passengers are allergic to bee venom, be especially careful to look before you put your hand in a spot that might have been invaded.

I have also known bees to invade the cockpit and cabin area. Several summers ago, a very large bee flew into my face just as I lifted off from a runway in coastal North Carolina. This "bee-stly" stowaway had been hiding behind the magnetic compass of my Cessna 182 until I rotated for takeoff. It was tough to quell the flail impulse during the initial surprise, but my first flight instructor's constant reminders to "fly-the-airplane first" paid off. It was clear that the bee was perfectly capable of flying itself, so I calmed down and concentrated on flying the airplane to a safe altitude. Once established in cruise, I enlisted the help of a handy sectional chart to put the bee out of my misery.

If you spend much time around general aviation airports, you have probably had, or heard of, similar experiences. Many pilots understandably perceive birds and bees as pesky and persistent creatures and, where airplanes are concerned, they are. Consequently, prevention strategies and careful preflight inspections are probably the best defenses that a pilot or aircraft owner can muster. Here are a few tips:

Prevention: At any time, but especially during nesting season, leaving any opening on your airplane uncovered or unplugged is tantamount to leaving your house key in the front door lock. Preventing winged squatters from taking up residence in your wings, especially if your airplane lives outside, requires that you "lock up" by plugging every possible path to the engine compartment, fuselage, pitot-static ports, and other openings. Strategies include:

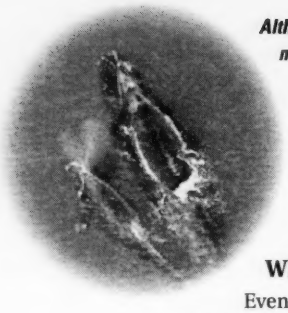
- Closing the cowl flaps (if installed) when securing the aircraft
- Installing custom-fit plugs on the air intake ports
- Using a pitot tube cover
- Blocking tailcone openings (e.g., those on a Mooney)
- Installing aircraft covers (including wing covers)
- Using "bird spikes" or other commercially-available devices to discourage birds from perching on any part your aircraft

H. Dean Chamberlain photo

It is that time of the year when birds are building nests. This photograph shows the overnight results of one pair of birds as they tried to build a nest in this Piper aircraft. It took several days of removing their nest before they gave up and left the aircraft.

Preflight: In the movie Jurassic Park, one of the scientists observed that "nature will find a way." This caution certainly applies to birds and bees, whose persistence can overcome the most determined pilot's efforts at prevention. Consequently, your preflight inspection should be especially thorough during nesting seasor.. As you approach the aircraft:

- Look for tell-tale signs of bird activity (e.g., excessive waste, bits of straw or other nesting material, or, of course, numerous birds perching on your plane).
- Look before you put your hand in any spot that might be occupied by bees or other insects.
- Listen closely. I once knew to look for the birds in the tail section only because I heard them fluttering and thumping around inside.
- Inspect the cockpit and cabin area for possible stowaways before launching, especially if the doors or windows have been open during your preflight inspection.



Although people like to go whale watching, pilots need to maintain the proper minimum altitude over whales to avoid disturbing them.

Florida Fish and Wildlife Conservation Commission photo

Whale Watching

Even if you live near the ocean, it's a safe bet that you will never have to worry about whales invading your airplane. Whales, on the other hand, sometimes have to worry about having their space invaded—illegally—by aerial sightseers in general aviation aircraft. Since the beginning of the year, the National Oceanic and Atmospheric Administration (NOAA) has documented several private aircraft off the coasts of Georgia and Florida circling in close proximity to right whales, which are a critically endangered species in the baleen whale family.

Here's the rule. We pilots aren't keen on having wildlife invade our space, and the law requires us to return the favor when it comes to operating in the vicinity of certain animals. You are probably already aware of the requirement to fly at least 2,000 feet above ground level (AGL) over wildlife preserves depicted on sectional aeronautical charts. What you may not know, though, is that if you fly near any place that right whales are known to live, the law (Title 50 Code of Federal Regulations section 224.103(c)) prohibits you from approaching within 1,500 feet (500 yards) of these creatures, unless you have a permit from the National Marine Fisheries Service. If you do not have such authorization, the law requires that you establish a course away from any right whale and immediately depart the area at a constant airspeed, unless compliance would create an "imminent and serious threat" to a person, vessel, or aircraft.

So keep a sharp lookout, and do your part to "fly friendly" wherever you happen to be.

Susan Parson is a special assistant in the FAA's General Aviation and Commercial Division. She holds an ATP certificate with an airplane multiengine land rating and commercial privileges for airplane single-engine land. She also holds advanced and instrument ground instructor certificates and a flight instructor certificate with ratings for airplane single and multiengine land and instrument airplane.

Sharing the Skies—Safely

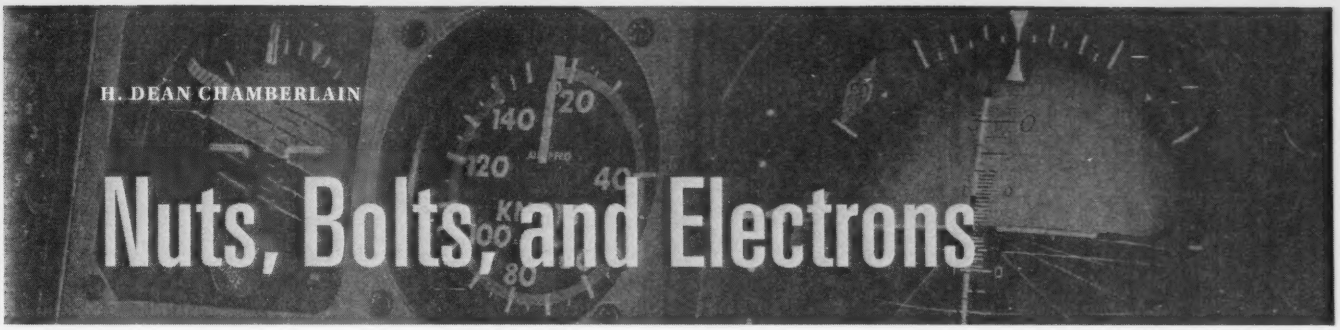
Nesting activity is by no means the only avian danger to aircraft. Bird and other wildlife strikes to aircraft annually cause more than $600 million in damage to U.S. civil and military aviation. Furthermore, these strikes put the lives of aircraft crew members and their passengers at risk. Nearly 200 people have been killed worldwide as a result of wildlife strikes since 1988.

Bird Strike Committee USA was formed in 1991 to facilitate the exchange of information, promote the collection and analysis of accurate wildlife strike data, promote new technologies for reducing wildlife hazards, promote professionalism in wildlife management programs on airports through training and advocacy of high standards of conduct for airport biologists and bird patrol personnel, as well as to serve as a liaison to similar organizations in other countries.

Bird Strike Committee USA is a volunteer organization directed by a steering committee that includes two to three members each from the FAA, the U.S. Department of Agriculture, the Department of Defense, and the aviation industry. Areas addressed by Bird Strike Committee USA include:

- Bird and other wildlife strike reporting/statistics
- Bird management and control techniques
- Research on new technologies to reduce wildlife hazards
- Training in wildlife management on airports
- Military concerns of wildlife hazards
- Aircraft engines/components related to wildlife hazards
- Policy/airport standards concerning wildlife hazards
- Land use and environmental issues concerning airports
- Bird migration and general ornithology related to aviation
- Remote sensing/modeling to detect and predict bird movements

For more information, see the Bird Strike Committee USA's Web site at: http://www.birdstrike.org/.



H. DEAN CHAMBERLAIN

Nuts, Bolts, and Electrons

Rebuilt or Overhauled—What Is the Difference?

Sooner or later, every aircraft owner will face the issue of how to deal with a run-out engine. The arguments made for (or against) "rebuilt" or "overhauled" may be as confusing as they are impassioned. Is there a difference?

Although some use the terms interchangeably, there are specific FAA definitions for each one. They can apply to an aircraft, airframe, aircraft engine, propeller, appliance, or component part. In this article, we will focus on how the terms apply to a general aviation piston aircraft engine.

Safety and reliability are likely at the top of any pilot or aircraft owner's list. As long as the work is done properly, you can expect dependable service from any of these options. From a practical viewpoint, there are two ways to distinguish between these terms. The first is money. Not surprisingly, the amount you pay for the work will differ according to which engine option you choose. The second is engine hours, which has implications for both initial expense and resale value. Now, let's explore those definitions.

Rebuilt: As described in Title 14 Code of Federal Regulations (14 CFR) section 43.2 (b), a rebuilt engine is one that has been not only "disassembled, cleaned, inspected, repaired as necessary," but also "reassembled and tested to the *same tolerances and limits as a new item*" [emphasis added]. The aviation maintenance technician (AMT) may use new parts, but it is also acceptable to install used parts, if they conform to new part tolerances and limits. A "rebuilt" engine is usually the most expensive option. It is sometimes called a "zero-time" engine, not only because it has been rebuilt to the same tolerances and limits as a new item, but also because it was rebuilt by the original equipment manufacturer (OEM). The rules say that *only* the OEM can rebuild an engine and sell it as "zero time" with a new engine record.

Overhaul: The description of "overhaul" (also in 14 CFR section 43.2) is similar. As with a rebuilt engine, the process of disassembly, cleaning, inspection, repair, and reassembly must follow "methods, techniques, and practices acceptable to the Administrator." The difference is that an overhauled engine does not have to conform to new part tolerances and limits. Rather, it need only be tested in accordance with approved standards and technical data developed by the holder of a Type Certificate or Supplemental Type Certificate. The overhaul option is often the least expensive choice.

There are several other terms you may hear in association with aircraft engine overhaul. FAA Advisory Circular 43-11 (Reciprocating Engine Overhaul Terminology and Standards can be found at http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf) is a great resource for understanding the jargon:

- "Major overhaul" typically means complete disassembly of the engine, inspection, repair (if needed), reassembly, and testing. It can be approved for return to service, if it is within the OEM's specified fits and limits.
- "Top overhaul" is the repair of parts outside of the crankcase. It can be accomplished without completely disassembling the engine.
- "Service limits" describes maximum permissible wear for parts.
- "Manufacturer's minimum and maximum" is a term that describes dimensions or specifications for new parts. It can refer to new or used parts in an engine.

Over to You

There is no "right" or "wrong" answer when it comes to choosing how you will proceed with a run-out aircraft engine. Just be sure you understand exactly what you are buying. Research the options, understand the terms, and know which questions you need to ask and answer to get the solution that's right for you.

H. Dean Chamberlain is an Aviation Safety Analyst in Flight Standards Service's General Aviation and Commercial Division. He is a Commercial Single and Multiengine Land and Sea rated pilot; a Commercial Glider pilot, a Certificated Flight Instructor Airplane Single and Multiengine and Instrument, and an aircraft owner.

DANIEL ROLLER, *EDITOR, AVIATION MAINTENANCE ALERTS*

Aviation Maintenance Alerts

Beechcraft: B300; Cracked Windscreen; ATA 5610

A repair station submission reads, "At an altitude of 17,000 feet (and an outside temperature of minus 6 degrees Celsius) the right windshield cracked (about 2 inches outboard of the center post) from the top to the bottom in the outer pane. The aircraft returned to the departing airport without any problems [and] the windshield (P/N 101-384025-24) was replaced. There was no known cause for this part to have cracked."

Reference also the following *Alerts*: December 2004, for two such reports; January 2005, for another. The full part number returns 12 such reports from the FAA Service Difficulty Reporting System (SDRS) data base. Truncating this number from the right one digit at a time for successive searches yields the following results—almost all within the 5610 ATA code:

-1 returns, 113 entries since 1998;
-2 returns, 209 since 1995;
-3 returns, 218 since 1995;
-4 returns, 229 since 1995;
-5 begins mixing codes.

*Readers are reminded the SDRS search tool found at http://av-info.faa.gov/isdr/default.asp/ requires all part numbers to be entered WITHOUT dashes. —*Alerts *Editor)*

Part Total Time: 728.0 hours.

Cessna: 310L; Cracked Wheel; ATA 3246

A mechanic writes, "Upon changing a tire on a Cleveland wheel assembly on this aircraft, it was discovered the wheel half holding the bearing race was cracking. It had cracked over 180 degrees around the opening, which eventually could have [led] to a serious accident."

Contact with the aircraft owner provided additional discussion and two excellent photos [which can be seen in the February 2008 *Aviation Maintenance Alerts*]. The owner, Don Higgins, writes, "Some tips for owners and mechanics: we noticed the first indication of this problem as uneven tire wear. When we had [our mechanics] turn the tire 180 degrees to even out the wear, they found the loose race [prompting] them to look further. The wheel crack was [then] found, [having progressed] more than 180 degrees around the axle hole. My suggestion is anytime a wheel is off the axle, not only do the bearings need to be checked, but also the races. If the race is loose the tire needs to be pulled apart and checked to see if there is a crack causing the race to loosen up.

"Cessna 310s touch down is in the 90 knot range. To have a wheel assembly fail [as this one was working up to] would render the aircraft uncontrollable and easily cause injury or death to the pilot/passengers." (Provided wheel P/N's are 199-64 and/or 40-40A.)

Thanks Don, for the time and trouble. Your effort might well cause other owner/operators to pay careful attention for this defect. —Alerts Editor

Part Total Time: 2,200.0 hours.

Diamond: DA-20; Broken Horizontal Stabilizer Bolts; ATA 5551

A technician for a flight training school writes, "[This aircraft] returned from flight with both horizontal stabilizer mount bolts broken (P/N AN3-11A)."

"We removed the rudder and horizontal stabilizer to inspect the entire area. The aft mount plate and forward mount bracket were replaced, along with all new bolts, washers, and nuts. We also inspected our other [DA-20] aircraft and replaced all of their [horizontal stabilizer mounting] bolts. No other issues were found on our aircraft. Diamond Aircraft has been briefed and they are working with the NTSB (National Transportation Safety Board)."

Part Total Time: 189.9 hours.

Mooney: M20J; Corroded Cowling Rivets; ATA 7110

A technician for a repair station writes, "The owner brought [his aircraft's] cowlings in for repair because the through-skin rivets were corroding and

shearing off at the manufacturer's head as exhibited by blistering paint at the rivet locations. Inspection revealed most of the AD [composition code 2117] rivets were severely corroded because the cowlings are constructed with a hybrid composite laminate of e-glass and carbon graphite plies. It is standard industry practice to use corrosion resistant fasteners, such as Monel rivets through carbon graphite structure—it is unknown why aluminum rivets were used in this case." (No part numbers were provided with this submission.) *Part Total Time: (unknown).*

Piper: PA17; Corroded Strut Tubes; ATA 3230

A mechanic holding an IA (inspection authorization) says, "When changing shock cords on this aircraft, I noticed a discoloration of the inner strut tube (the longer tube, P/N 11804-00). I removed it from the outer tube (the shorter tube, P/N 11803-00). One of these inner strut tubes was corroded approximately 50 per cent [around] its circumference. The other inner strut had multiple corrosion holes through out [the part]. Both outer short tubes showed oval elongation at the ends, indicating flexing/bending of this assembly during landings and takeoffs. I believe only the relatively new bungees kept this gear from final failure and [the predictable] ground loop.

"Installed bungee cords cover this [corrosion] area and they also [usually] have a cloth or aluminum fairing over them. Detection of this [defect] requires removal of the fairings at a minimum, and [preferably] removal of the bungees to clearly see the outer tube's circumference. To inspect the area that failed, it is necessary to disassemble the unit (P/N 11803-00) and view the inner and outer pieces separately. I would recommend whenever bungees are changed, the pieces should be removed from the aircraft, disassembled, and inspected for corrosion." *Part Total Time: 2,500.0 hours.*

Piper: PA31-350; Failed Main Gear Bolt; ATA 3230

A mechanic writes, "Our aircraft had a 'gear unsafe light' and no 'left down and locked' indication light. The gear handle [also] would not return to neutral position. The aircraft landed without incident. We believe the upper bolt retaining the main gear retraction arm broke due to fatigue. This allowed the main gear actuator to bind on the upper section of the drag leg, breaking the main gear actuator ball end out of the main shaft of the actuator.

"There is a Piper Service Letter Number 1092 (dated June 15, 2005) that requires the Main Gear Retraction Arms (P/N's 42042-000 or 42042-002) to be inspected (at 1500 hours) using a 10 power magnifying glass and liquid penetrant. Thereafter, [this inspection is performed] at each 250 hours until the part reaches retirement at 6,000 hours.

"There is no requirement for the bolts (P/N AN6-17) that retain the main gear retraction arms to be inspected or replaced. These bolts are [given a cursory] inspection during retraction arm removal, by a visual check for wear and corrosion. We believe these bolts need to also have a life limit or be magnaflux inspected. These bolts showed little wear. The bolt that failed appears it may have been cracked for sometime before it failed completely, but it was not detected during the last compliance with SL-1092." The FAA Service Difficulty Reporting System (SDRS) data base returns 14 similar entries for the base part number 42042 with ATA 3230.)

Raytheon: 400A; Partial Nose Gear Up-lock Engagement; ATA 3230

A repair station technician states, "The flight crew reported the red [colored] landing gear handle warning light stayed illuminated after gear retraction. The gear was cycled several times—the handle warning light stayed illuminated. [Inspection] found the nose gear landing up-lock was not fully engaging. [We] adjusted the up-lock as required per the Beechjet 400 series maintenance manual. Landing gear retract/extension checks were okay; no faults [observed]. We have noted this [up-lock adjustment defect] on low-time Beechjet 400A series aircraft on several occasions, particularly during cold weather operation. Up-lock adjustment faults usually show up in the [maintenance manual] 32-00-00 functional low pressure/low flow tests." *Part Total Time: 243.4 hours.*

The Aviation Maintenance Alerts *provide a common communication channel through which the aviation community can economically exchange service experience, and cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those who operate and maintain civil aeronautical products, and can be found on the Web at http://www.faa.gov/aircraft/safety/alerts/aviation_maintenance/. The monthly contents include items that have been reported as significant, but have not been evaluated fully by the time the material went to press. As additional facts, such as cause and corrective action, are identified, the data will be published in subsequent issues of the* Alerts. *This procedure gives* Alerts *' readers prompt notice of conditions reported via a Malfunction or Defect Report (M or D) or a Service Difficulty Report (SDR). Your comments and suggestions for improvement are always welcome. Send them to: FAA; ATTN: Aviation Data Systems Branch (AFS-620); P.O. Box 25082; Oklahoma City, OK 73125-5029, or e-mail to the* Maintenance Alerts Editor *at daniel.roller@faa.gov.*

Creating Aviation's Next Generation

In a time where the aviation industry is rife with stories predicting massive shortages of pilots, air traffic controllers, and aviation maintenance technicians, our nation is challenged to introduce and mentor its young people toward technical fields in aviation. Aging employee pools and increasing demand on air travel has placed the recruiting of young, highly trained, and qualified individuals as a nation-wide priority. Focused on creating the next generation of aviation professionals, the FAA's Aviation and Space Education Program (AVSED) is the central point of outreach to the young people of the nation, providing information and exposure to the vast opportunities in the aviation industry.

As part of its vision for meeting the need for aerospace education, AVSED created the Aviation Career Education (ACE) Academy program. First launched in 1990, the ACE Academies are co-sponsored by the FAA and held in partnership each year with various industry groups and organizations around the country. ACE Academies are typically a week-long experience for the student, who gets exposure to a wide variety of aerospace career opportunities. Using a Science, Technology, Engineering and Mathematics (STEM) standardized curriculum, students learn about aircraft design and maintenance, flight simulation, aviation history, meteorology, and the theory of flight. Many students also experience

their first flight lessons in a general aviation (GA) aircraft, which have included seaplanes and gliders. Some academies tour air traffic control (ATC) facilities, airlines, maintenance facilities, and airport operations centers. Students are also exposed to educational opportunities and careers in the military.

One of the more unique elements of the FAA co-sponsored ACE Academies is the partnership which has been formed between the AVSED Program and the Department of Defense. Students enrolled in FAA co-sponsored ACE Academies have the ability to ride aboard U.S. military aircraft for an orientation flight, if an aircraft is available. Several exciting examples include a trip aboard a KC-135 *Stratotanker* for a refueling mission, flights on C-130s, and *Blackhawk* helicopters.

This program was created, and continues, due to a relatively small group of dedicated and passionate FAA employees and their partners in the industry. Volunteerism is a major component of this program and is vital to its continued success. Because of the support of state aviation education councils, state aeronautics divisions, educational institutions, and local aviation businesses, the ACE Academy program now occurs in nearly every state. The diversity of opportunities that these volunteers can provide makes each ACE Academy unique in its offerings and highlights the intriguing career paths available in their region.

No matter where your particular field of expertise in the aerospace industry lies, you can positively affect the lives of young people in your area. If you want more information about how to get involved in ACE Academies, visit www.faa.gov/education/ for a list of the regional FAA Aviation and Space Education Program Managers.

Julie Seltsam-Wilps is the FAA New England Region's Aviation and Space Education Program Manager. She has a Commercial pilot certificate with an Instrument rating for airplane single-engine land and is a Certificated Flight Instructor for airplane single-engine land.

FAA Aviation and Space Education Program photos

One of the benefits the ACE program provides its participants is the opportunity to go out on a flight line to check out aircraft such as this Daniel Webster College Cessna.

Satisfied Customers

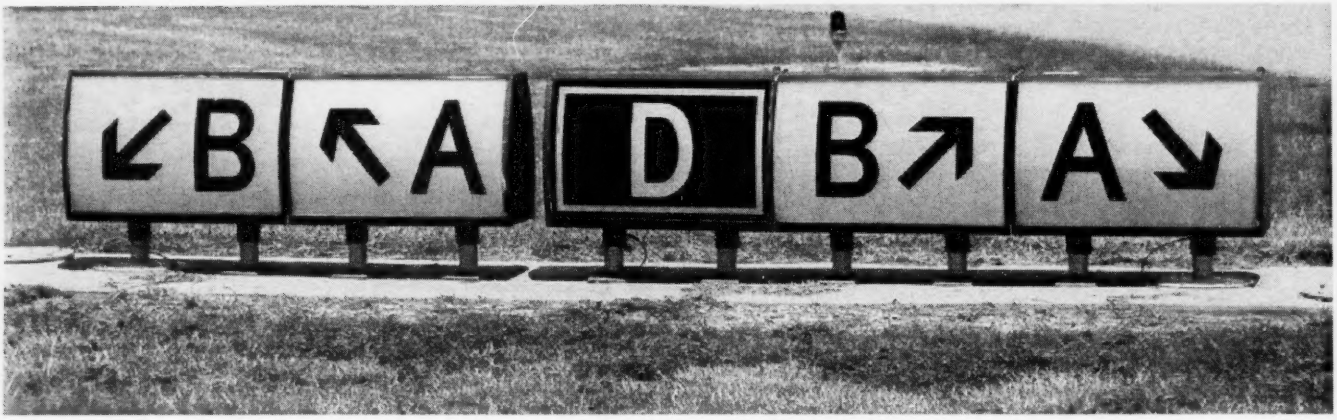
The enthusiasm and excitement of our industry is infectious, and the students are often eager to share the impact that ACE Academies have had on their lives:

"I had a blast and after the experience I have decided that I am definitely going to work my hardest to become a pilot." — 2007 ACE STUDENT

"Thank you so much, I wouldn't be on this road towards a career in aviation without the help of ACE Academy! I can't thank you enough!" — 2006 ACE STUDENT

"If it wasn't for ACE Academy I don't think I'd be flying around in *Blackhawks* all day *smiles*" — 2002 ACE STUDENT

Airport Sign Quiz



When you see a sign like this on the airport, do you know what it is trying to tell you?

Now that the flying season is here and more airmen are taking to the sky, let's test your knowledge of airport signs.

Place the letter matching the description of each sign or runway marking on the appropriate line.

A. Identifies runway approach area holding position.

B. Identifies the Instrument Landing System (ILS) critical area boundary.

C. Identifies the runway (or taxiway) on which the aircraft is located.

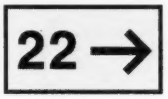
D. Do not enter.

E. Identifies boundary of the runway protected area.

F. Provides general taxiing direction to named runway, taxiway, or other airport destination.

Answers to airport signs quiz on page 9.

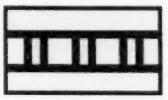
1. _____



2. _____

3. _____

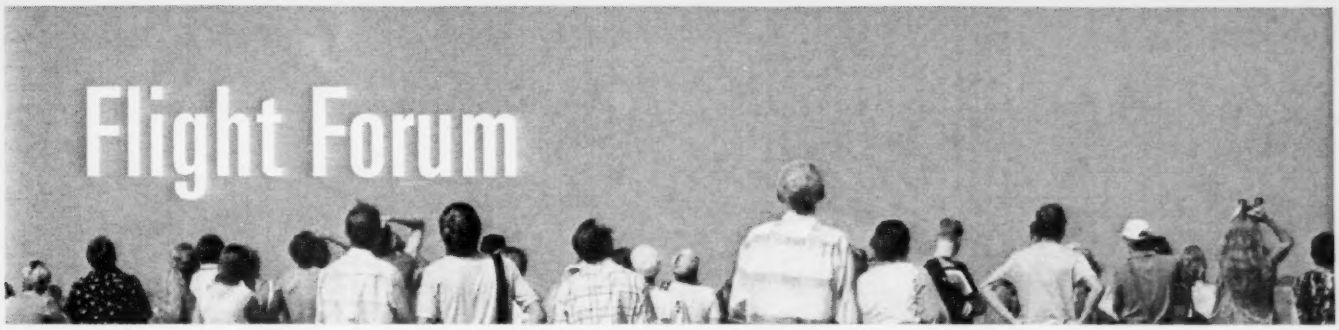
4. _____



5. _____

6. _____

Flight Forum



Kudos on the New Look

As an editor emeritus of *FAA Aviation News*, I must say the new format, layout, and design look wonderful! Nice, crisp lines, good mix of graphics and text, and excellent presentation all around. I like the FAA Faces segment, especially. Congratulations for a job well done.

— **Phyllis Anne Duncan**
Manager, Technical Information and Communications Programs Branch

Thanks for the kind words.

Getting around on the Ground

I do not understand the article entitled "Getting Around On The Ground." It is on Page 13 of the March/April 2008 edition. The article implies that the pilot stopped immediately after crossing the runway hold lines. If he/she did, what was done incorrectly?

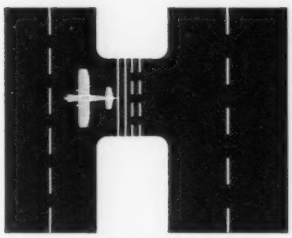
— **Charles Maynard**
Via the Internet

We handed your question over to the article's author, Susan Parson, who provided the following clarification:

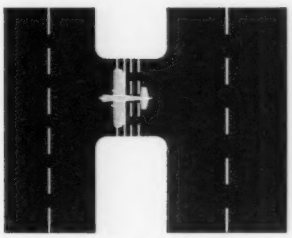
Your question—one asked by almost every pilot who heard my verbal account right after the flight—is the main reason I decided to share the story. We are all trained to taxi completely clear of the solid yellow lines when exiting the runway, and, in most cases, that is exactly the right thing to do. The quote from the Aeronautical Information Manual *(AIM) paragraph 4-3-20 (at the top of page 14 in the March/April magazine) states that: "In the absence of ATC instructions, the pilot is expected to taxi clear of the landing runway by taxiing beyond the runway holding position markings associated with the landing runway, even if that requires the aircraft to protrude into or cross another taxiway or ramp area."*

The key words for the situation I described in the article are in italics at the bottom of page 13 in the March/April magazine. Upon landing, the pilot should "taxi clear, unless otherwise directed by ATC." Because the tower controller did indeed "otherwise direct" by asking me to hold short of the taxiway, those instructions took precedence. Check the diagrams of what I did and what I should have done according to the controller's instructions.

I certainly learned something from this experience, and I hope it benefits other pilots as well.



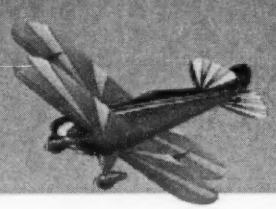
Correct action "unless otherwise directed by ATC."



Correct action when directed to hold short of taxiway.

FAA Aviation News *welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Readers are reminded that questions dealing with immediate FAA operational issues should be referred to their local Flight Standards District Office or Air Traffic facility. Send letters to Editor,* FAA Aviation News, *AFS-805, 800 Independence Avenue, SW, Washington, DC 20591, or FAX them to (202) 267-9463, or e-mail them to AviationNews@faa.gov.*

JAMES WILLIAMS



AV News

New Deadline for CAO English Language Endorsement

The International Civil Aviation Organization (ICAO) requires that all persons who hold a private, commercial, or airline transport pilot certificate/license with an airplane or helicopter rating have a language proficiency endorsement on their pilot certificate as of March 5, 2008. No other pilot certificates are affected. Flight engineer, flight navigator, and control tower operator certificates are also required to have the language proficiency endorsement. U.S. certificate holders operating aircraft outside of the U.S. may be required to have this endorsement when acting as required crew. However, an extension has been granted to U.S. pilots moving the deadline to March 5, 2009 (amended from March 5, 2008).

Although all U.S. certificate applicants are required to meet the English language eligibility requirements of Title 14 Code of Federal Regulations parts 61, 63, and 65, the regulations do not require U.S. certificate holders to have a language proficiency endorsement on their certificates. However, to satisfy the ICAO language proficiency endorsement requirements, the FAA will provide, upon request, a replacement certificate to any certificate holder affected by the ICAO requirements with the additional endorsement, "English Proficient."

In order to obtain a U.S. replacement certificate with the "English Proficient" endorsement, a certificate holder submits a request to the FAA through the FAA Web site at www.faa.gov/licenses_certificates/airmen_certification/english_proficiency/ or by mail to Federal Aviation Administration, Airmen Certification Branch, AFS-760, P.O. Box 25082, Oklahoma City, OK 73125-0082. The request must include the following information: name, date, and place of birth, Social Security number and/or certificate number, and the reason you are requesting a replacement certificate. The cost to the airman is $2.00. If mailing the request, please submit a check or money order in U.S. funds for the amount.

All new U.S. certificates issued after February 11, 2008, contain the "English Proficient" endorsement.

NTSB Safety Alert on CFIT Accidents

The National Transportation Safety Board (NTSB) issued a Safety Alert on Controlled Flight Into Terrain (CFIT) accidents in visual conditions. Recent NTSB investigations identified several accidents that involved Controlled Flight Into Terrain by both Instrument Flight Rules (IFR)-rated and Visual Flight Rules (VFR) pilots operating under visual flight conditions at night in remote areas. It also recommends some strategies for avoiding these kinds of accidents, including preflight planning and terrain familiarization. For the complete alert, you may visit: http://www.ntsb.gov/alerts/SA_013.pdf/.

Final Rule on MU-2B Training and Operating Requirements

On January 28, the FAA finalized a Special Federal Aviation Regulation (SFAR) that creates new pilot training, experience, and operating requirements to increase the safety of the widely used Mitsubishi MU-2B airplane. The MU-2B turboprop is a complex aircraft that has unique flight characteristics. Fully understanding the aircraft's complexity is much more critical during an emergency situation.

The final rule mandates a comprehensive standardized pilot training program for the MU-2B, use of a standardized cockpit checklist, and the latest revision of the airplane flight manual. MU-2B operators also must have a working autopilot onboard, except in certain limited circumstances. Owners and operators must comply with the SFAR within a year.

"The FAA studies enormous amounts of data looking for trends," said FAA Associate Administrator for Aviation Safety Nick Sabatini. "When we saw the rising accident rate for the MU-2B, we decided to take appropriate actions to bring the plane up to an acceptable level of safety."

Following an increase in MU-2B accidents and incidents in 2004 through 2005, an FAA safety evaluation of the aircraft in late 2005 found that changes in training and operating requirements were needed. The safety evaluation produced a number of recommendations, including proposal of an SFAR. This SFAR is part of a larger program to improve MU-2B safety.

The final rule is available at http://edocket.access.gpo.gov/2008/08-398.htm/.

ICAO Collecting Data on Wake Turbulence Encounters

The International Civil Aviation Organization (ICAO) has started an effort to collect information on wake vortex encounters. The initiative stems from the A380 Wake Vortex Steering Group, which was created as a result of concerns about the Airbus A380-800 entering service. This led to an overall review of the current wake turbulence categorization scheme used by ICAO.

ICAO has requested that contracting states make available reporting forms to pilots, aircraft operators, and air navigation service providers. These forms can be found at ICAO's Web site at www.icao.int/fsix/wakevortex/. The forms may also be submitted via e-mail to wakevortex@icao.int.

FAA Approves First Business Jet for RNP Approaches

The FAA has approved the first business jets to fly public Required Navigation Performance (RNP) approaches with Special Aircraft and Aircrew Authorized Required (SAAAR), marking another advance toward the Next Generation Air Transportation System (NextGen). The FAA authorized four of Gulfstream Aerospace's business jet models to use RNP SAAAR approaches after a nine-month-long qualification process. Only a few specific models of commercial aircraft have received similar approval. Approval is given after aircraft operators or manufacturers commit to FAA-qualified procedures.

Area navigation (RNAV) is a satellite-based method of navigation that allows aircraft to fly on any desired flight path within a coverage area, instead of being limited to routes that pass from one ground-based navigation aid to the next. RNP is an onboard component of RNAV. Specifically, it is the ability of the aircraft to monitor its own navigation system performance, and notify the pilot when that performance is not sufficient for a particular operation.

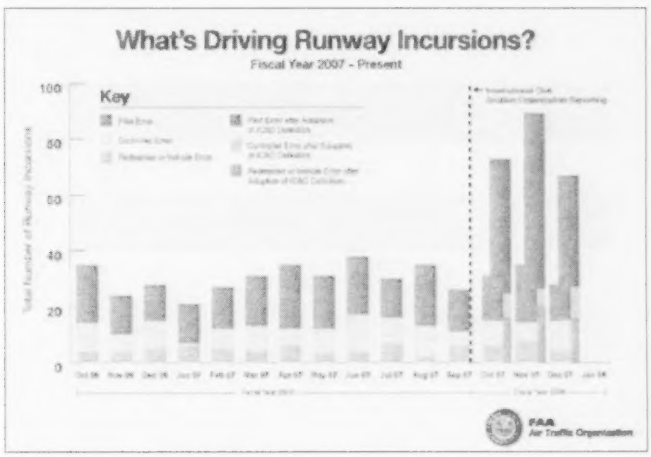
The FAA published an initial roadmap for RNAV and RNP systems in 2003, after working with the aviation industry—including Alaska Airlines, which originally developed RNP in the 1990s, as a means of increasing flight safety in that state's rocky terrain and fitful weather. The International Civil Aviation Organization (ICAO) decided to aggressively support worldwide navigation's transition to RNAV and RNP systems that same year.

One advantage of RNP is that it uses technology and equipment already in place on most commercial air carriers, although varying degrees of additional crew training or cockpit procedures are also required. RNAV's more direct method can conserve flight distance, reduce congestion, and allow aircraft to fly into airports without beacons.

For more information, see: https://employees.faa.gov/news/focusfaa/story/index.cfm?newsId=55730/.

FAA Issues New Fact Sheet on Runway Incursions

On February 13, 2008, the FAA issued a new fact sheet on runway incursions. Reducing the risk of runway incursions is one of the top priorities for FAA and the number of serious incursions (classified as Category A and B) dropped by more than 55 percent between fiscal year (FY) 2001 and FY 2007.



The number of Category A and B incursions for the first quarter of FY 2008 was 10. Some changes have been made in the classification of runway incursions this year when FAA adopted the International Civil Aviation Organization (ICAO) definition of runway incursion, which was more inclusive than the previous FAA definition. For more information the full fact sheet is available at: http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=10166/.

SUSAN PARSON

Editor's Runway

New Directions

Change is one of the few constant features of general aviation, which has benefited greatly in recent years from the many new and updated designs we see at events like Sun 'n Fun. In that spirit, and to help mark the 50th anniversary of the FAA later this year, this issue of the *FAA Aviation News* continues this year's introduction of a fresh new design, layout, and format. Just as today's avionics make it easier for pilots to read information from flight deck displays, we have designed the new format to make the publication easier to read. You can expect to see several regular columns, starting with Jim Ballough's *Jumpseat* at the front and ending with Lynn McCloud's *FAA Faces* on the inside back cover of each issue.

As you may have guessed from the photo in the column heading, this issue also marks my debut as co-editor, along with Dean Chamberlain. I am honored to join the magazine team in this capacity, and I am very excited to be part of this publication's new directions.

While we're on the subject of new directions, let me share some thoughts about content. Everyone is busy these days, so we are aiming for shorter, more focused feature articles that will help explain the FAA's policies, procedures, and priorities. In response to your requests and suggestions, we plan to give you more information on FAA programs and resources that can help you fly safely. In addition, we are planning articles that will describe more of what the FAA does on a day to day basis, and specifics on how the agency supports some of the year's major aviation events. Other feature articles will focus on flying skills, such as Mike Lenz's *Learning to Fly in Weather*, and seasonal tips, such as *Birds, Bees, and Baleen Whales*.

We are aiming for shorter, more focused feature articles that will help explain the FAA's policies, procedures, and priorities. We also plan to give you more information on FAA programs and resources that can help you fly safely.

As we continue to define and refine this updated publication, we are very eager to hear what you—our customers—think about the new format. Send comments by e-mail to AviationNews@faa.gov or to our U.S. postal mail address (shown on the inside front cover). We would also like to hear from you if you have an idea for a story, photo, or an article you'd like to submit for possible publication. We'll be happy to send you the submission guidelines for articles and photography, plus information about deadlines.

English Language Endorsement

Speaking of deadlines, there is an innate human tendency to delay many requirements until the last possible minute. Many of us take that approach to taxes, and I confess that I sometimes procrastinate on writing for this magazine, waiting for that moment of inspiration to hit. I don't get much of a reprieve from the magazine publication deadlines, but I'm happy to report that the FAA recently extended the deadline for compliance with an International Civil Aviation Organization (ICAO) requirement that affects any pilot flying across international borders.

As reported in the last issue (page 34 of the March/April *FAA Aviation News*' AV News section), the ICAO General Assembly agreed several years ago that ICAO member states, which include the United States, should begin documenting pilots' proficiency in English, which is the universal language of aviation. ICAO members agreed to a March 5, 2008, deadline for airmen of any ICAO member state to have an English proficiency endorsement printed on their certificates in order to fly internationally. As of February 11, 2008, all new U.S. certificates include the English Proficiency endorsement. However, there was widespread concern about whether all U.S. airmen, who need the endorsement, could meet the March 2008 deadline. For this reason, the FAA exercised an option to extend the deadline until March 5, 2009. That's good news, but, if the requirement applies to you, please don't wait another year to apply for a certificate that includes the English language proficiency requirement. Visit the FAA Web site at www.faa.gov/ licenses_certificates/airmen_ certification/english_ proficiency/ today for more information, and get your application on its way.

LYNN MCCLOUD

FAA Faces: Kathleen O'Brien

Beauty, Peace, and a Passion for Safety

Kathleen O'Brien learned to fly in the California wine country. As a student, her short finals were over steel tanks holding Gallo wine. She had started flying lessons as an "empty nest" activity to do with her husband. Yet, what she started as a pursuit with someone else quickly became her own passion.

"Once I got up there, it was so beautiful; I felt a sense of peace I've never felt anywhere else."

That was all O'Brien needed. In short time, avocation became vocation. Her first aviation job: An entry-level position at a fixed-base operator (FBO) in Santa Rosa, California, where her duties were about as far removed from the glamour of aviation as possible. Hard work and persistence led to another FBO, to ground school instruction, to marketing at an aerospace engineering firm, to flight instruction, and later, after a move to Southern California, to more flight instruction and volunteer work with the FAA Safety Team (FAASTeam). Her next step was from FAA volunteer to FAA staff. After ten years with FAA, O'Brien is now FAA Safety Team (FAASTeam) Program Manager for Long Beach, Los Angeles, and San Diego where she oversees FAA safety outreach activities in Southern California's highly complex airspace.

O'Brien's biggest priority: Finding ways to make runways safer.

On a clear bright Sunday afternoon, it is possible "to have 1,600 airplanes in one practice area over the ocean near the Long Beach Airport. With our year-round flying weather, the Southern California skies are always busy with gliders, hot air balloons, helicopters, paragliders, hang gliders, you name it," O'Brien says.

Her biggest priority: Finding ways to make runways safer. The airspace is busy, but it is on the surface where aircraft are in close proximity with limited options. Yes, she says, technology helps, "but we really need the community of airmen—pilots, air traffic controllers, maintenance workers, and ground personnel—to recognize how we are all part of a beautiful and complex system," O'Brien stresses. "And, we need to get to the hearts of people."

Humor and having fun helps. When O'Brien first joined FAA, she put together "Runway Safety: The Board Game." She used laminated placemats. One side had the layout of the Long Beach Airport. She had students label its runways, taxiways, and taxi and hold markings. After they finished, they turned the mat over to find a fully marked airport diagram. Then, with the help of local Air Traffic Controllers, students teamed up to listen and respond to instructions to move toy airplanes correctly around the "airport." "This was a non-threatening way for students to discover what they really knew about their home airport," O'Brien says. "People learn more readily when they are having fun and don't feel threatened."

When O'Brien began to teach flying, she cast an analytical eye on the learning process. Her first observation: Flight instructors too often focus on the "what," or the content of the lesson, and less on "how" to reach individual students. Teaching adult learners is more challenging and once you figure out how to reach each student, the "what" quickly follows. O'Brien speaks from experience. "I had been a good student my entire life. Yet, when I started flying, the more I struggled, the harder it got." Her first attempt at a stall resulted in a spin.

"My primary instructor, Louie Robinson, treated me with utmost respect and gentle patience," O'Brien notes. "Without those two qualities, my own passion to learn may have fizzled in frustration."

Her long experience as an instructor has shaped O'Brien's attitudes. "You have to respect the student's point of view—even if it is dramatically different than your own. Start with no assumptions," she adds. "Learning is a change in behavior and the instructor's job is to awaken a student to choose a new behavior."

Awakening pilots to the vital role they play in safety—that's what Kathleen O'Brien does every day.

Lynn McCloud is Special Assistant for Communications in Aviation Safety.

U.S. Department
of Transportation

**Federal Aviation
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The Federal Aviation Administration Wants You!

Attention pilots, mechanics, and avionics technicians:

This is your chance to start a career in the exciting field of federal aviation safety. The FAA's Flight Standards Service is currently hiring aviation safety inspectors. We are looking for individuals with strong aviation backgrounds for inspector positions in fields ranging from Maintenance to Operations, to Avionics. Both air carrier and general aviation inspectors are needed in all fields. There are positions available throughout the nation. This is your opportunity to use your experience to improve the already excellent safety record of civil aviation in the United States. As an aviation safety inspector you would be responsible for overseeing airmen, operators, and others to ensure they meet the rigorous safety standards set forth by the FAA.

The FAA is an excepted service agency of the United States Department of Transportation. Starting salaries range from $39,795 to $75,025 (FG 9- FG 12) plus locality pay (Locality pay is a geographical enhancement to your base salary). For more information please visit http://www.opm.gov/. Benefits include federal retirement and 401K type accounts. Health and other insurances are also available.

Qualifications vary depending on discipline. For details please visit http://jobs.faa.gov/. Under "All Opportunities" you can search by job series 1825 or title containing "inspector." The FAA is expecting to hire approximately 850 inspectors this fiscal year so start your application today.

FEDERAL AVIATION ADMINISTRATION